SERVICE MANUAL

KING SERIES

ASH-18AK, ASH-24AK

sinclair
AIR CONDITIONING

1 Summary and features

18 Outdoor unit:

24 Outdoor unit:

Model	Remarks
ASH-18AK **ASH-24AK**	**1Ph 220~240V 50Hz** **R410a**

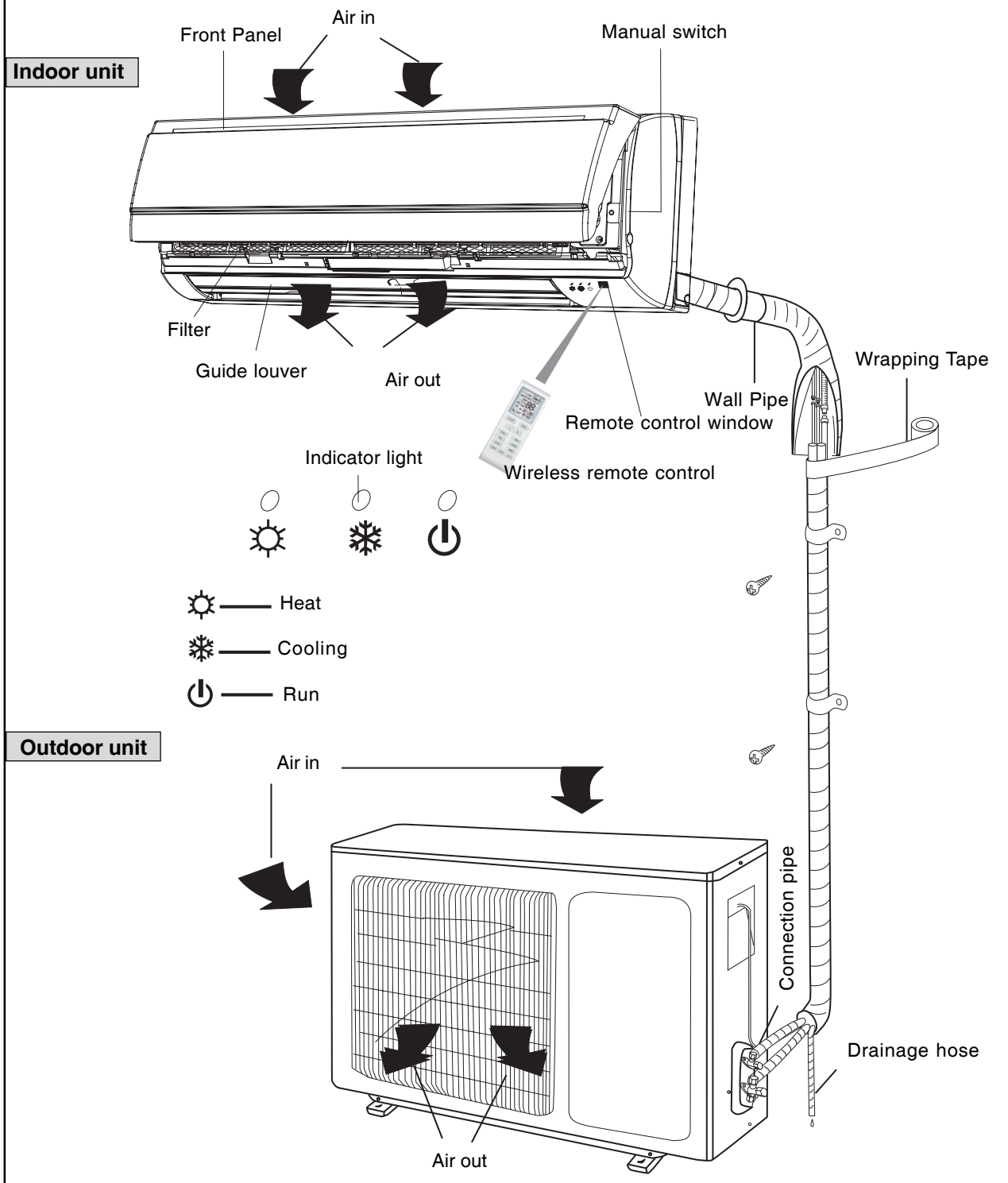
2 Technical specifications

Model		ASH-18AK .		ASH-24AK .	
Function		COOLING	HEATING	COOLING	HEATING
Rated Voltage		220-240V~		220-240V~	
Rated Frequency		50Hz		50Hz	
Total Capacity (Btu/h)		18000	19500	22000	23200
Power Input (W)		1640	1670	2120	2120
Rated Input (W)		2500	2550	3000	3000
Rated Current (A)		10.9	11.1	13	13
Air Flow Volume (m3/h) (H/M/L)**		830/670/600		830/670/620	
Dehumidifying Volume (l/h)		3		4	
EER / C.O.P (W/W)		3.21		3.01	
Energy Class		A		B	
Indoor unit	Model of Indoor Unit	ASH-18AK .		ASH-24AK .	
	Fan Motor Speed (r/min) (H/M/L)	1200/1050/900		1200/1050/950	
	Output of Fan Motor (w)	20		20	
	Input of Heater (w)	/		/	
	Fan Motor Capacitor (uF)	1		1	
	Fan Motor RLA(A)	0.4		0.4	
	Fan Type-Piece	Cross flow fan – 1		Cross flow fan – 1	
	Diameter-Length (mm)	φ96 X 797		φ96 X 797	
	Evaporator	Aluminum fin-copper tube		Aluminum fin-copper tube	
	Pipe Diameter (mm)	Φ7		Φ7	
	Row-Fin Gap(mm)	2-1.6		2.5-1.6	
	Coil length (l) x height (H) x coil width (L)	785X340.51X25.4		785X340.51X25.4	
	Swing Motor Model	MP35XX		MP35XX	
	Output of Swing Motor (W)	2.5		2.5	
	Fuse (A)	PCB 3.15A Transformer 0.2A		PCB 3.15A Transformer 0.2A	
	Sound Pressure Level dB (A) (H/M/L)	48/45/42/38		48/45/42/39	
	Sound Power Level dB (A) (H/M/L)***	58/55/52/48		58/55/52/49	
	Dimension (W/H/D) (mm)	1020X228X310		1020X228X310	
	Dimension of Package(W/H/D)(mm)	1078X390X325		1078X390X325	
	Net Weight /Gross Weight (kg)	14/19		15/20	

Outdoor unit	Model of Outdoor Unit		ASH-18AK .	ASH-24AK .
	Compressor Manufacturer/trademark		Shanghai Hitachi Electrical Appliances Co,Ltd./Highly	Shanghai Hitachi Electrical Appliances Co,Ltd./Highly
	Compressor Model		ASH210SV-C8LU	ASH264SV-C8LU
	Compressor Type		rotary compressor	rotary compressor
	L.R.A. (A)		40	60
	Compressor RLA(A)		7.5	10.3
	Compressor Power Input(W)		1725	2215
	Overload Protector			
	Throttling Method		Capillary	Capillary
	Starting Method		Capacitor	Capacitor
	Working Temp Range (℃)		-7℃≤T≤43℃	-7℃≤T≤43℃
	Condenser		Aluminum fin-copper tube	Aluminum fin-copper tube
	Pipe Diameter (mm)		7	Φ9.52
	Rows-Fin Gap(mm)		2-1.4	2-1.4
	Coil length(l) x height(H) x coil width(L)		806×660×25.4	804X660X44
	Fan Motor Speed (rpm) (H/M/L)		860	780
	Output of Fan Motor (W)		48	68
	Fan Motor RLA(A)		0.62	1.2
	Fan Motor Capacitor (uF)		3.5	2.5
	Air Flow Volume of Outdoor Unit		2790m3/h	3400m3/h
	Fan Type-Piece		Axial fan –1	Axial fan –1
	Fan Diameter (mm)		Φ473	Φ472
	Defrosting Method		Auto defrost	Auto defrost
	Climate Type		T1	T1
	Isolation		I	I
	Moisture Protection		IP24	IP24
	Permissible Excessive Operating Pressure for the Discharge Side(MPa)		3.8	3.8
	Permissible Excessive Operating Pressure for the Suction Side(MPa)		1.2	1.2
	Sound Pressure Level dB (A) (H/M/L)		56/54/52	56/54/52
	Sound Power Level dB (A) (H/M/L)		66/64/62	66/64/62
	Dimension (W/H/D) (mm)		913X680X378	950X700X412
	Dimension of Package (L/W/H)(mm)		994X720X428	1100X755X450
	Net Weight /Gross Weight (kg)		46/50	59/64
	Refrigerant Charge (kg)		R410/1.6	R410/1.85
Connection Pipe	Length (m)		4	4
	Gas additional charge(g/m)		50	50
	Outer Diameter	Liquid Pipe (mm)	Φ6	Φ9.52
		Gas Pipe (mm)	Φ12	Φ16
	Max Distance	Height (m)	10	10
		Length (m)	15	15

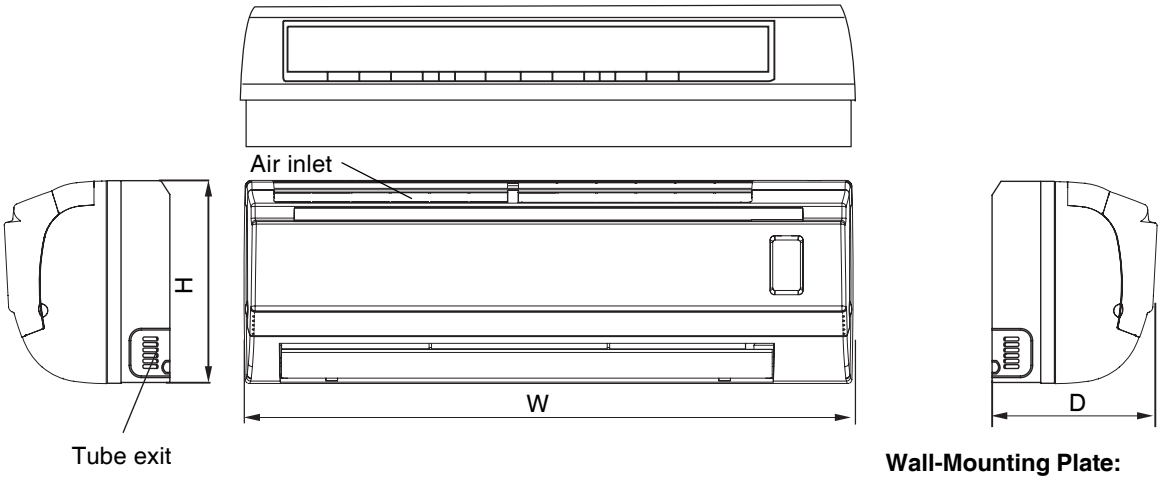
The above data is subject to change without notice. Please refer to the nameplate of the unit.

3 Part name

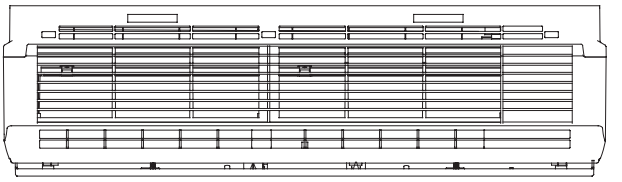

Indoor unit
Front Panel
Air in
Manual switch
Filter
Guide louver
Air out
Wall Pipe
Wrapping Tape
Remote control window
Wireless remote control
Indicator light
Heat
Cooling
Run
Outdoor unit
Air in
Connection pipe
Drainage hose
Air out

4 Outline and installation dimension

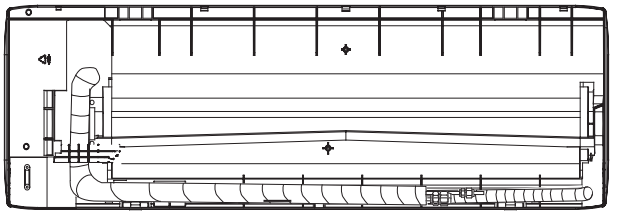
4.1 Outline and installation dimensions of indoor unit



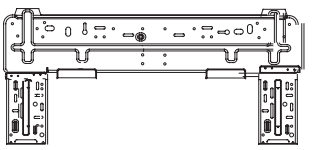
Wall-Mounting Plate:



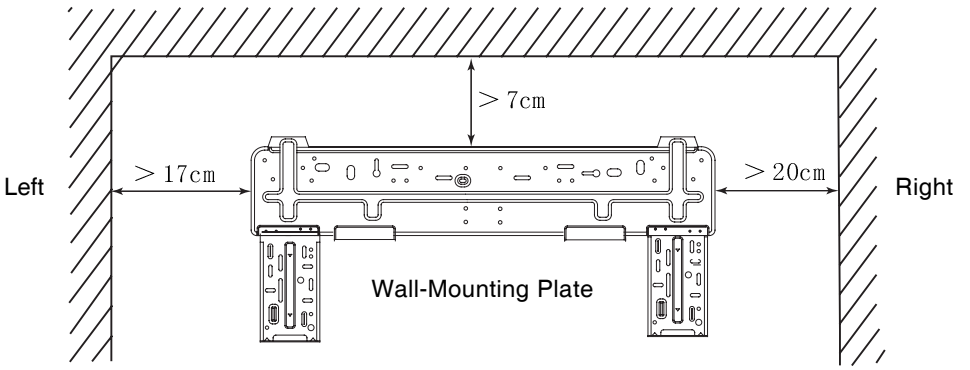
Rear View



18/24



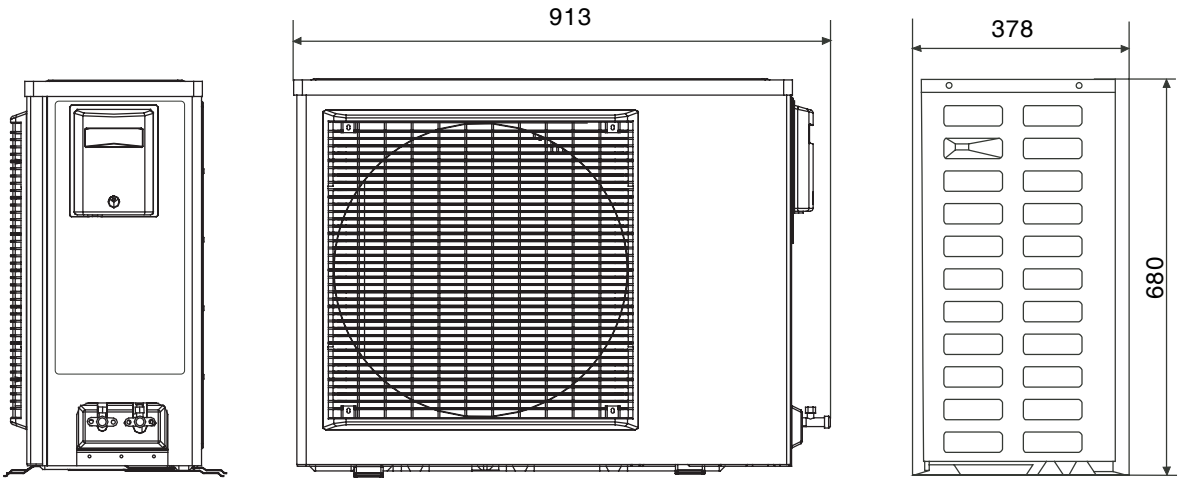
Ceiling

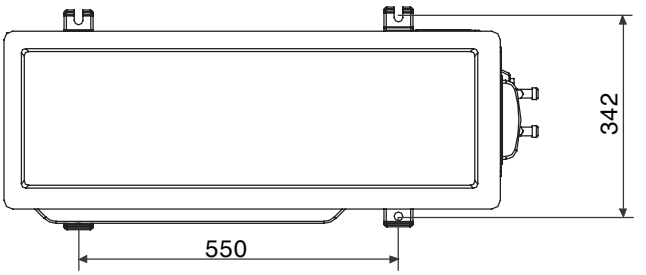


Model	W(mm)	H(mm)	D(mm)
ASH-18AK ASH-24AK	1020	228	310

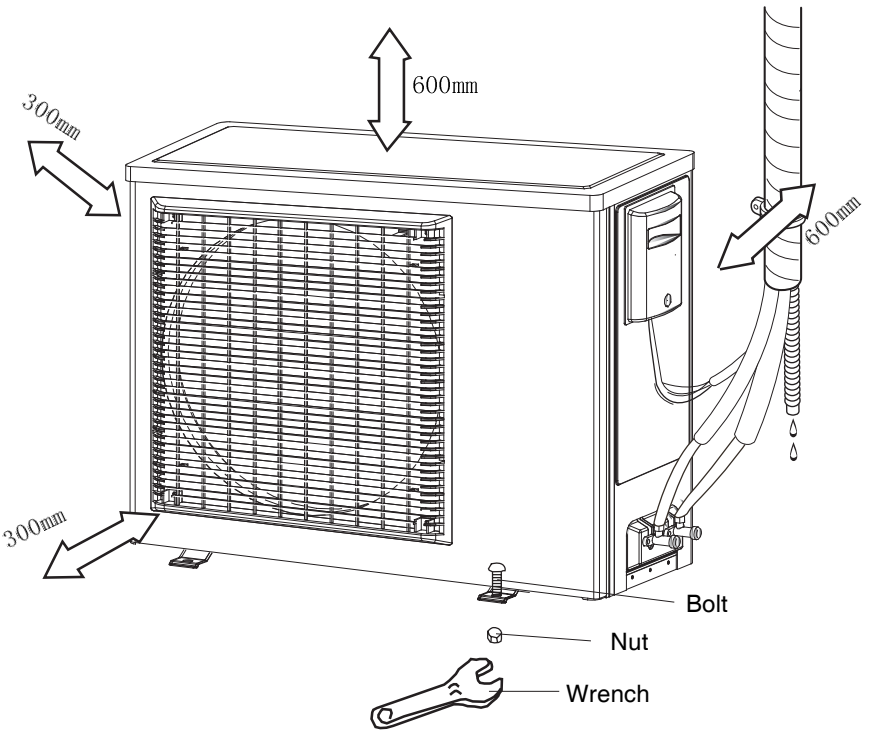
4.2 Outline and installation dimensions of outdoor unit

ASH-18AK

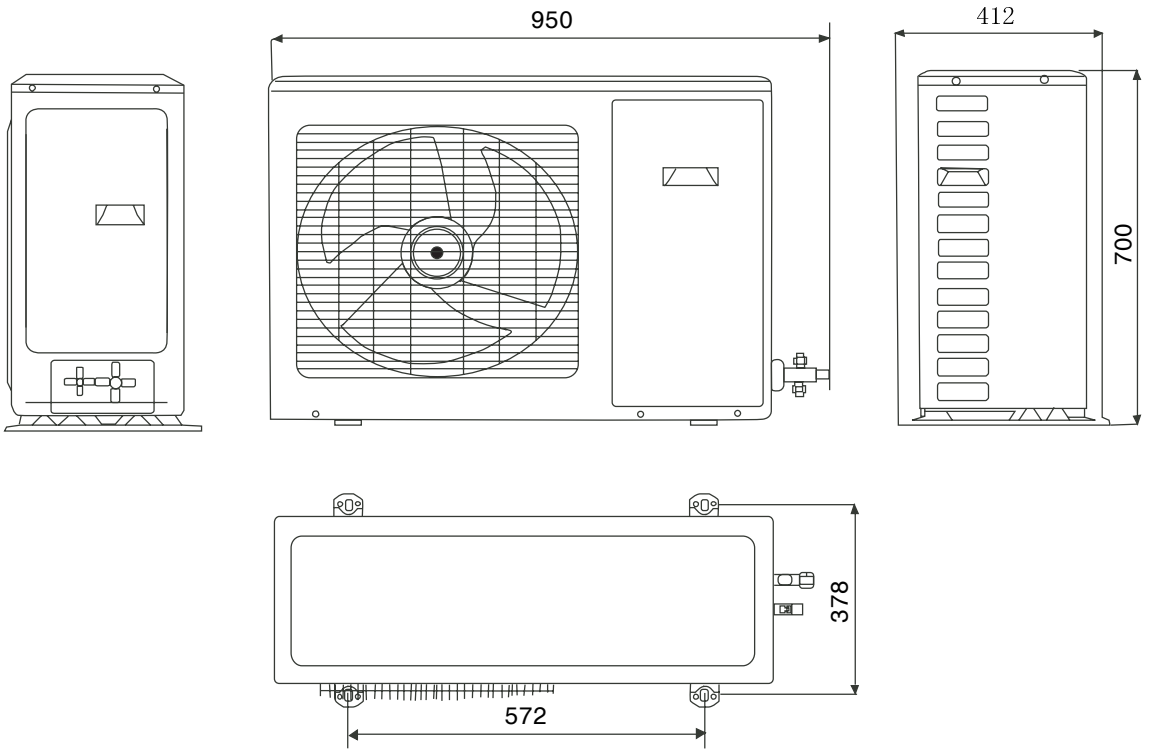




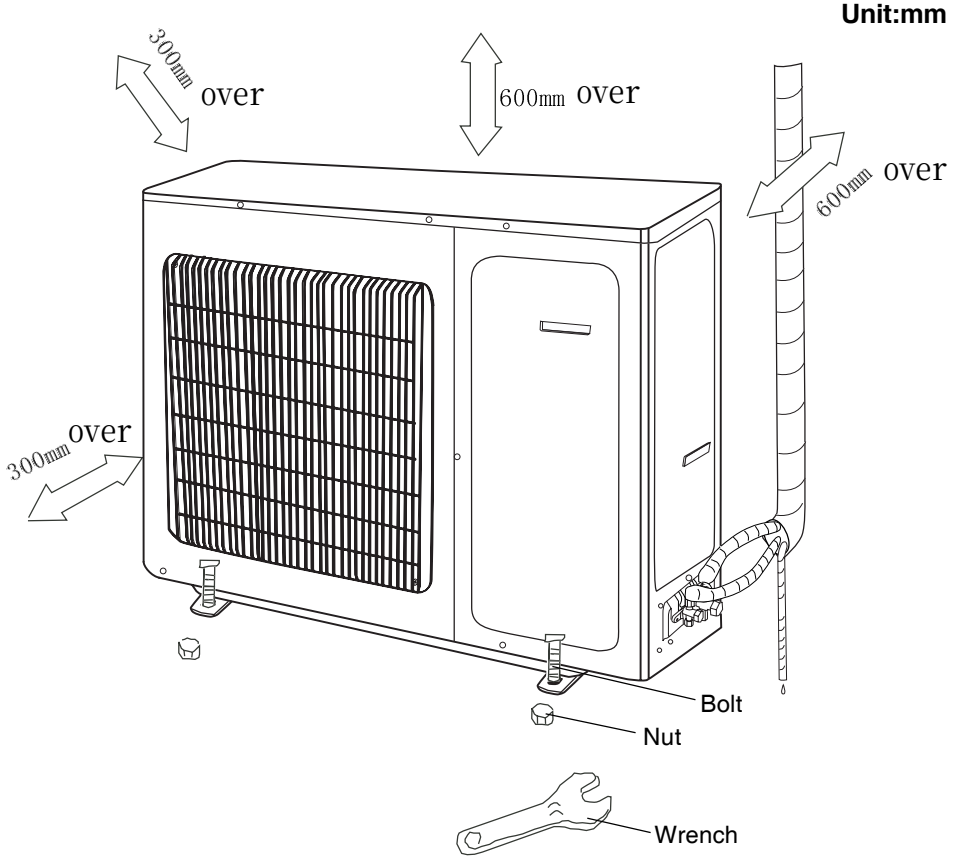
Unit:mm



ASH-24AK

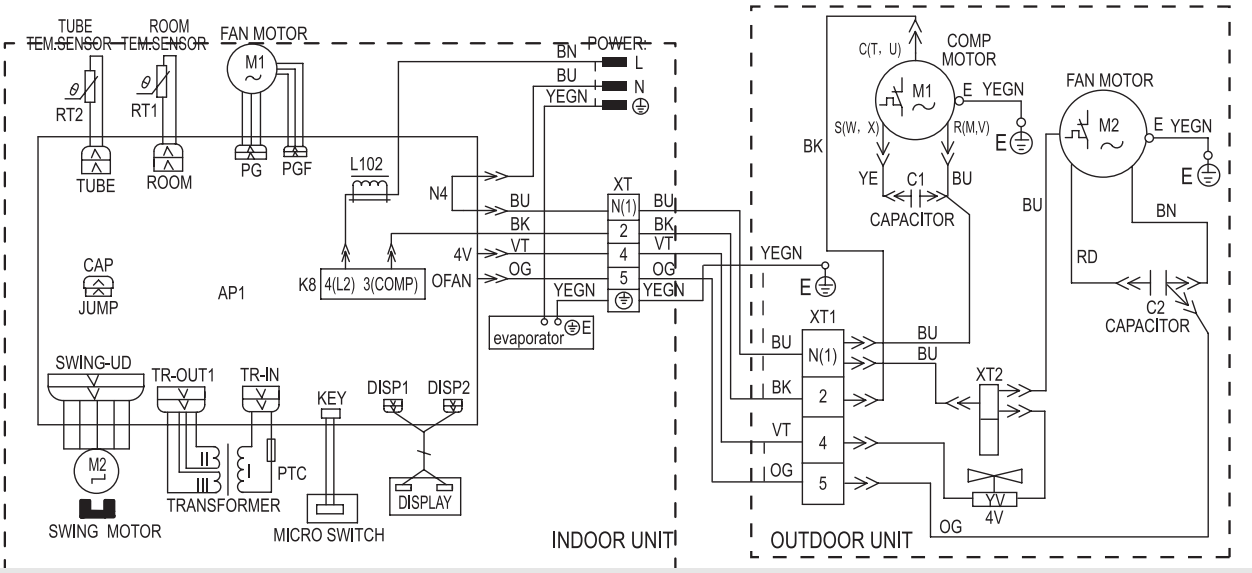


Unit:mm

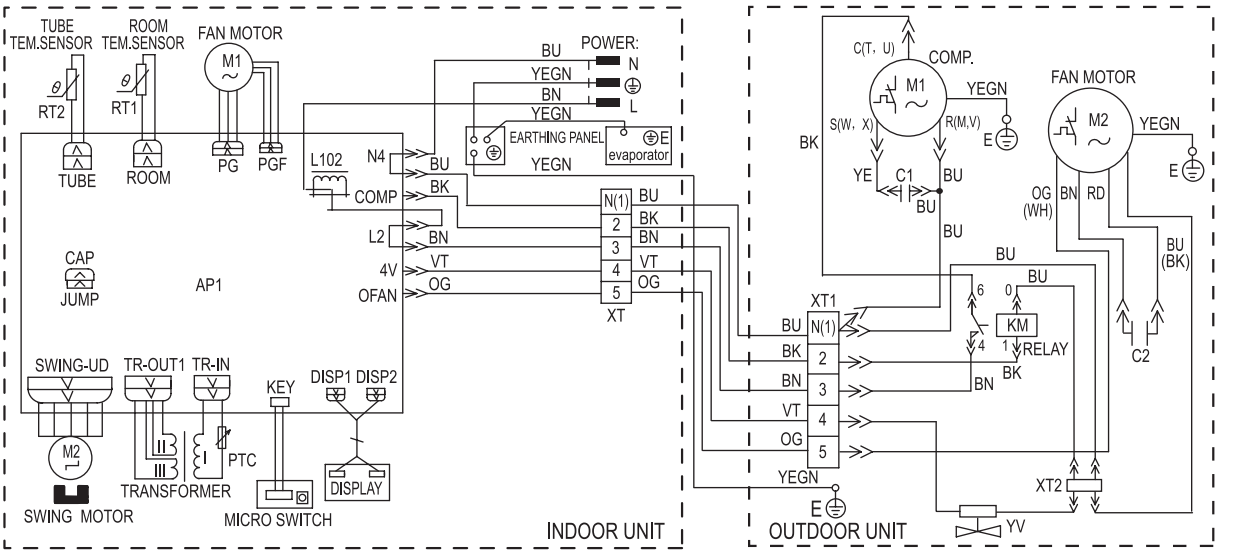


5 Electrical circuit diagram

ASH-18AK



ASH-24AK



These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.

6 Manual of functions of remote controller and operation method

6.1 Manual 1 of functions of remote controller

6.1.1 Temperature parameter

- **The room setting temperature(Tpreset)**
- **The room ambient temperature (Tamb)**

6.1.2Basic Functions

Once energized, the compressor should in no way be restarted unless after 3-minute time interval at least. For the first energization, the compressor will be started without 3-minute lag. The compressor, once started,will not be stopped within 6 minutes with the change of room temperature.

6.1.2.1 **Cooling Mode**

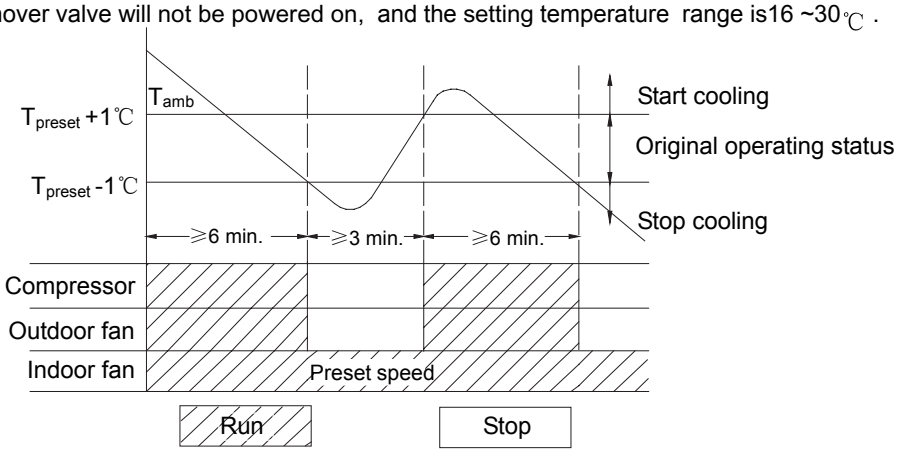
6.1.2.1.1 **Cooling Conditions and Process**

When $T_{amb.} \geqslant T_{preset}$ +1℃, the unit will run under cooling mode, in which case the compressor and outdoor fan will start and the indoor fan will run at setting speed.

When $T_{amb.} \leq T_{preset}$ -1℃, the compressor and the outdoor fan will stop, the indoor fan will run at setting speed.

When T_{preset} -1℃<$T_{amb.}$< T_{preset} +1℃, the unit will maintain its original operating status.

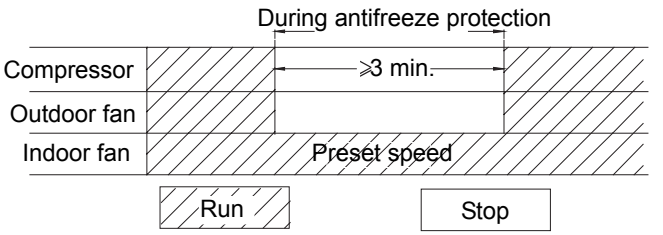
➢ Under this mode, the switchover valve will not be powered on, and the setting temperature range is16 ~30℃ .



6.1.2.1.3 Protection

◆ **Antifreeze Protection**

If it is detected that the system is under antifreeze protection, the compressor and outdoor fan will be stopped, and the indoor fan will run at setting speed. When antifreeze protection is released and the compressor has stopped for 3 minutes, the unit will resume its original operating status.



6.1.2.2 DRY Modes

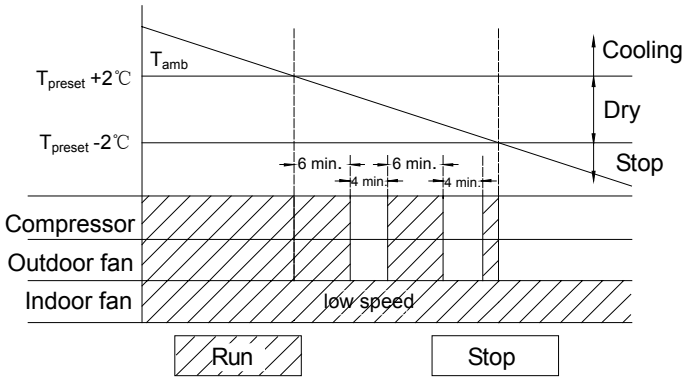
6.1.2.2 .1 The conditions and process of DRY

When $T_{amb.} > T_{preset}$+2℃, the unit will run under DRY cooling mode, in which case the compressor and outdoor fan will be started and the indoor fan will run at low speed.

When T_{preset} -2℃$\leqslant T_{amb.} \leqslant T_{preset}$ +2℃, the unit will run under DRY mode, in which case the indoor fan will keep run at low speed, the compressor and the outdoor fan will be stopped after 6 minutes . After 4 minutes,the compressor and the outdoor fan will be restarted. The dehumidifying process is so repeated in cycle.

When $T_{amb.} < T_{preset}$-2℃, the compressor and outdoor fan will be stopped, the indoor fan will run at low speed.

➢ Under this mode, the switchover valve will not be powered on, and the setting temperature range is16 ~30℃ .



6.1.2.2.3 Protection

◆ **Antifreeze Protection**

Upon meeting the cooling condition, if it is detected that the system is under antifreeze protection, the compressor and outdoor fan will be stopped,and the indoor fan will run at low speed. When antifreeze protection is released and the compressor has stopped for 3 minutes, the complete unit will resume its original operating status.

Upon meeting the dehumidify condition, if it is detected that the system is under antifreeze protection, the com -pressor and outdoor fan will be stopped,and the indoor fan will run at low speed. When antifreeze protection is released and the compressor has stopped for 4 minutes, the complete unit will resume its original operating status.

6.1.2.3 HEAT Mode (there is no this mode for cooling only unit)

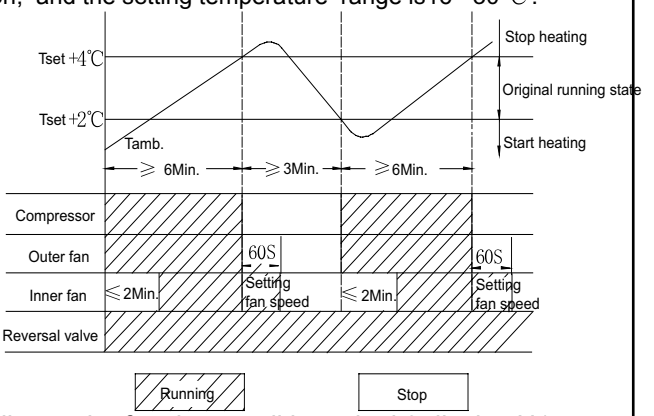
6.1.2.3 .1The conditions and process of heating

When Tamb ≤ Tset +2 ℃,the system enters heating running, in this case, the reversal valve, compressor, outer fan enter simultaneously running.The indoor fan will delay at most for 2min to run.

When Tamb ≥ Tset +4℃,the compressor and outdoor fan will stop, but the reversal valve is still with power on, the indoor unit will run at setting fan speed for 60s then will stop .

When Tset +2 ℃<Tamb < Tset +4 ℃,the unit will maintain its original operating status.

➢ Under this mode, the switchover valve will be powered on, and the setting temperature range is16 ~30 ℃.



6.1.2.3.3 Conditions and processes of defrost

This unit adopt intelligent defrosting,it can defrost according to the frosting conditions,dual 8 display H1

6.1.2.3.4 Protection

◆ **High Temp. Protection**

If it is detected that the evaporator tube temperature is too high, the outdoor fan will be stopped. When the tube temperature resumes to normal, the outdoor fan will be restarted.

◆ **Noise Silencing Protection:** If the unit is stopped by pressing ON/OFF, the reversal valve will be stopped after 2-minute lag; or 2 minutes will be delayed upon mode switching.

6.1.2.4 Fan mode

Under FAN mode, only the indoor fan runs at setting speed.The RUN indicator will be bright. Double 8 module indicator will display the setting temperature. When stand by, the power indicator is bright but the unit does not run.

6.1.2.5 Auto Mode

Under this mode, the system will automatically select its run mode (cool, dehumidify, heat or fan) with the change of ambient temperature. For protection function, same as under cooling and heating mode.

3.Other controls

1. Memory function

Memory contents: Mode, up and down swing, Light, Setting temp., Setting fan speed, Ordinary setting Fahrenheit/Centigrade, after powered off, and powered on, it will run at the memory contents.

If no timer setting function in last remote control order, the system will memorize the last remote control order, the system will memorize the last remote control order and work with last remote control setting.

In the last remote control order, there is ordinary timer function, if power off happen beffore the timer arrived, the system will memorize the last remote control timer function, and will recalculate.

If there is timer function in last remote control order, but timer has arrive, system will run at timer on or timer off and power off, after repowered on, the system will run at the mode before power off.

（2 ）Timer function

1.Ordinary Timer setting:

Timer on: Under unit off, the timer on function could be set up, if timer on has arrived, controller will run at setting mode, the timer interval is 0.5hr, setting range is 0.5-24hrs.

Timer off: Under unit off, the timer off function could be set up, if timer off has arrived, controller will run at setting mode, the timer interval is 0.5hr, setting range is 0.5-24hrs.

②Timer setting for hour:

Timer on: if system is running, to set timer on, the system will continue to run, if unit is off to set up timer on, when timer on has arrived, the system will run at pressetting mode.

Timer off: If system is off to set up the timer off, when to set up timer off, the unit will stand by, when unit is on, to set up timer off, when the timer off arrived, the system will stop to work.

Timer setting change:

When system is in Timer status, can set up timer on and timer off by wireless remote control, to reset up Timer also, the system will run at last setting status.

When system is running, at the same time to set up Timer on and Timer off, the system will keep the present setting status, when time arrived, system will stop to work.

When system stop, at the same time to set up Timer on and Timer off, the system will stop, untile the timer arrived, the system will start to work.

Hereafter, when timer of timer on in every day arrived, it will run the presetting modes, after timer off arrived, the system will stop.

(3) Auto button

After powered on, press this button, it will run at Auto mode, when repressed, the unit will turns off.

(4) Buzzer

The controller is powered on and detect the signal received, the buzzer will beep.

(5) Sleep function

Under cooling or dehumidifying mode, the preset temperature will automatically rise by 1℃, ine hour after setting of sleep program and rise by 1℃after 2hours.

Under heating mode, the preset temperature will automatically decrease by 1℃ one hour after setting of sleep program and decrease by another 1℃after 2hours.

(6) Turbo function

The turbo function is available in Cool and Heat modes.

(7) Dry function

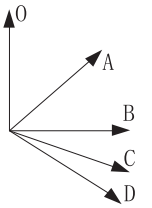
Dry function is available in Cool and Dehumidifying modes.

(8) Auto fan speed control

In this mode, indoor fan can run with Hig, Mid, Low speeds.

(9) Up and down swing control

After powered on, the lower swing motor will firstly rotate the guide louver to position 0, close up the air outlet vent; After unit turned on, if to set up swing function, when indoor fan stop running, the guide louver will stop at current position, inner fan motor is running, guide louver will resume to swing.From Cool, Dry, Fan modes to Heat mode, the guide louver will be opened at D position, when turn on swing will run at (A-D); from Heat mode to Cool, Dry, Fan mode, the fan louver will turn to B position, if turn on the swing, it will run at (A-C).



(10) Displayer

① Running figure and mode figure display

After powered on, the figure will be displayed, then only Power/running indicator turn on. When using remote conroller to open the unit, it will turn on, at the same time to display current setting running modes.

② Dual 8 display

When the unit is turned on, after powered on, the nixie tube will display the setting temp.(setting range is 16-30℃). Under Auto mode, cooling and fan will display 25℃, heating will display 20℃, cooling only control display 25℃.

③ LCD Display

When cooling and dehumidifying, the Cool and indicator will turn on, when heating, the Heat and Run indicaor will turn on, when in fan mode, the indicator will turn on.

(11) PG motor lock protection

When turn on the fan motor, if motor continuously run for a while and the running speed is very slow, in order to prevent motor automatically self-protection, it will stop running and display lock; If currently turns unit on, that dual 8 will display lock error code H6; If current is unit off, will not display the block error information.

6.2 Manual 2 of functions of remote controller

This manual is applicable to ASH-18AK, 24AK models, the centigrade is used for the following function manual, if there will be the Fahrenheit degree, that will be TF= TCX1.8+32.

1. Temperature parameter

◆ **The room setting temperature(Tpreset)**

◆ **The room ambient temperature (Tamb)**

2 Basic Functions

Once energized, the compressor should in no way be restarted unless after 3-minute time interval at least for the first energization, the compressor will be started without 3-minute lag. The compressor, once started, will not be stopped within 6 minutes with the charge of room temperature.

（1）Cooling Mode

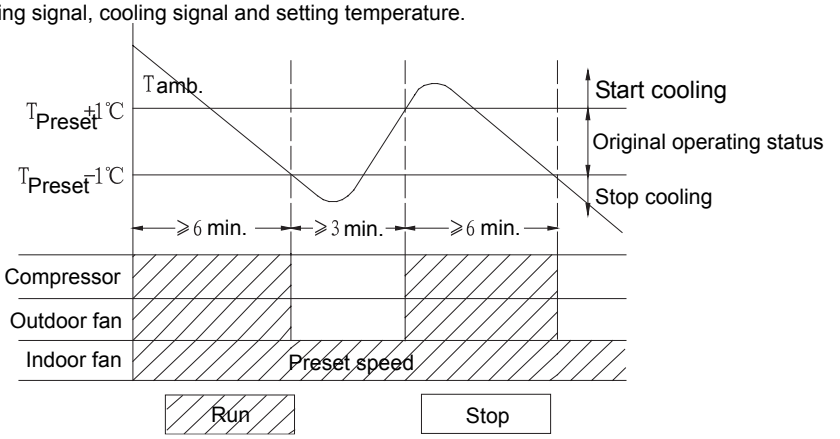
① Cooling Conditions and Process

When Tamb.≥Tpreset +1℃, the unit will run under cooling mode, in which case the compressor and outdoor fan will start and the indoor fan will run at setting speed.

When Tamb.≤Tpreset－1℃, the compressor and the outdoor fan will stop, the indoor fan will run at setting speed.

When Tpreset － 1℃<Tamb.<Tpreset＋ 1℃, the unit will maintain its original operating status.

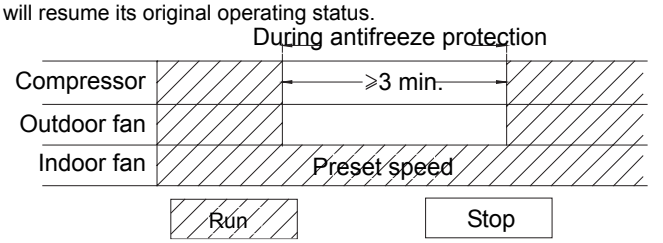
➢ Under this mode, the four-way valve will not be powered on and the setting temperature range is 16-30℃.
The displayer displays running signal, cooling signal and setting temperature.



② Protection

◆ Antifreeze Protection

If it is detected that the system is under antifreeze protection, the compressor and outdoor fan will be stopped, and the indoor fan will run at setting speed. When antifreeze protection is released and the compressor has stopped for 3 minutes, the unit will resume its original operating status.



③ Over current protection

If it is detected that the system amperage exceeds the specified value(about 22 A), the main unit will enter into the status that only the fan is running. After 3 minutes and overcurrent protection is released, the main unit will resume its original operating status .If it is 6 times continuously detected overcurrent protection (if the compressor has run over 6 mins continuously, the times of protection will be cleared),the main unit will be stopped on standby,the nixietube will display error code "E5", power indicator will blink and it is need to restart the unit by the wireless remote control.

（2）DRY Modes

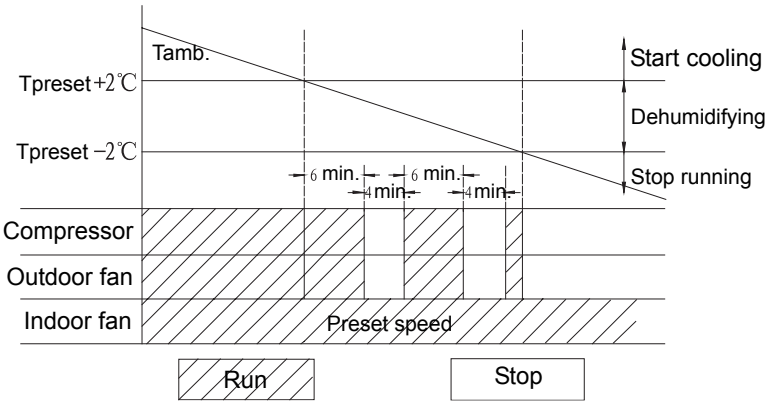
① **DRY Modes**

When Tamb.＞Tpreset+2℃, the unit will run under DRY cooling mode, in which case the compressor and outdoor fan will be started and the indoor fan will run at low speed.

When Tpreset－2℃≤Tamb.≤Tpreset +2℃ , the unit will run under Dry mode, in which case the indoor fan will keep run at low speed, the compressor and outdoor fan will be stopped after 6mins. After 4 minutes, the compressor and outdoor fan will be restarted. The dehumidifying process is so repeated in cycle.

When Tamb.＜Tpreset － 2℃, the compressor and outdoor fan will be stopped, the indoor fan will run at low speed.

➢ Under this mode, the switchover valve will not be powered on and the setting temperature range is 16-30℃.



② **Protection**

◆ **Antifreeze Protection**

Under dehumidifying and cooling mode, if it is detected that the system is under antifreeze protection, the compressor and and outdoor fan will be stopped, and the indoor fan will run at low speed. When antifreeze protection is released and the the compressor has stopped for 3 minutes, the complete unit will resume its original operating status.

Upon meeting "run 6 mins and stop 4 mins" dehumidify condition, if it is detected that the system is under antifreeze protection,the compressor and outdoor fan will be stopped, and the indoor fan will run at low speed. When antifreeze protection is released and the compressor has stopped for 4 minutes, the complete unit will resume its original operating status.

③ Other protection

The other protections are the same with that under Cool mode.

（3）**HEAT Mode (there is no this mode for cooling only unit)**

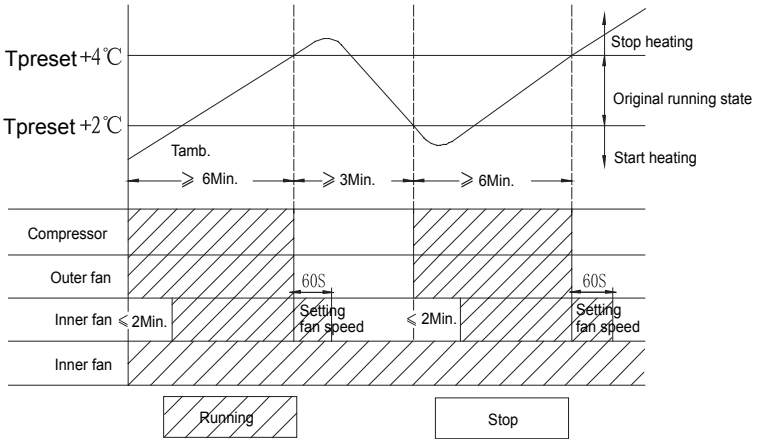
① **The conditions and process of heating**

When Tamb ≤ Tset＋2℃ ,the system enters heating running, in this case, the reversal valve, compressor, outer fan enter simultaneously running.The indoor fan will delay at most for 2min to run.

When Tamb ≥ Tset+4℃,the compressor and outdoor fan will stop, but the reversal valve is still with power on, the indoor unit will run at setting fan speed for 60s then will stop .

When Tset+2℃＜Tamb＜Tset＋4℃ ,the unit will maintain its original operating status.

➢ Under this mode, the switchover valve will be powered on and the setting temperature range is 16-30℃.



② **Conditions and processes of defrost**

This unit adopt intelligent defrosting,it can defrost according to the frosting conditions,dual 8 display H1

③ **Protection**

◆Anti-high temperature protection

If it is detected that the evaporator tube temperature is too high, the outdoor fan will be stopped. When the tube temperature resumes to normal,the outdoor fan will be restarted.

◆ **Noise Silencing Protection**

If the unit is stopped by pressing ON/OFF, the reversal valve will be stopped after 2-minute lag; or 2 minutes will be delayed upon mode switching.

④ Over current product

The overcurrent protection is the same with the the over current protection under cool mode.

（4）Fan mode

Under FAN mode, only the indoor fan runs at setting speed.The RUN indicator will be bright. Double 8 module indicator will display the setting temperature. When stand by, the power indicator is bright but the unit does not run.

（5）Auto Mode

Under this mode, the system will automatically select its run mode (cool, dehumidify, heat or fan) with the change of ambient temperature. For protection function, same as under cooling and heating mode.

3 Other controls

（1）Timer function

① Ordinary Timer setting:

timer on: Under unit off, the timer on function could be set up, if timer on has arrived, controller will run at setting mode, the timer interval is 0.5hr, setting range is 0.5-24hrs.

Timer off: Under unit off, the timer off function could be set up, if timer off has arrived, controller will run at setting mode, the timer interval is 0.5hr, setting range is 0.5-24hrs.

② Timer setting for hour:

Timer on: if system is running, to set timer on, the system will continue to run, if unit is off to set up timer on, When timer on has arrived, the system will run at pressetting mode.

Timer off: If system is off to set up the timer off, when to set up timer off, the unit will stand by, when unit is on, to set up timer off, when the timer off arrived, the system will stop to work.

Timer setting change:

When system is in Timer status, can set up timer on and timer off by wireless remote control, to reset up Timer also, the system will run at last setting status.

When system is running, at the same time to set up Timer on and Timer off, the system will keep the present setting status, when time arrived, system will stop to work.

When system stop, at the same time to set up Timer on and Timer off, the system will stop, untile the timer arrived, the system will start to work.

Hereafter, when timer of timer on in every day arrived, it will run the presetting modes, after timer off arrived, the system will stop.

（2）Auto button

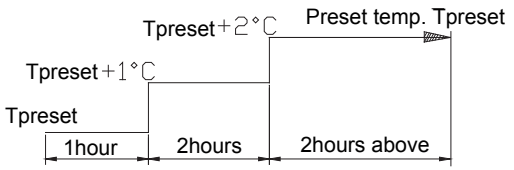
After powered on, press this button, it will run at Auto mode, when repressed, the unit will turns off.

（3）Buzzer

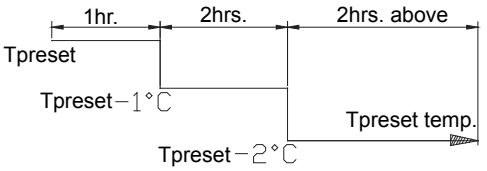
The controller is powered on and detect the signal received, the buzzer will beep.

（4）Sleep function

Under cooling or dehumidifying mode, the preset temperature will automatically rise by 1℃, ine hour after setting of sleep program and rise by 1℃after 2hours.



Under heating mode, the preset temperature will automatically decrease by 1℃ one hour after setting of sleep program and decrease by another 1℃after 2hours.



（5）Turbo function

The turbo function is available in Cool and Heat modes.

（6）Dry function

Dry function is available in Cool and Dehumidifying modes.

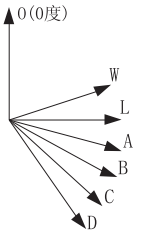
（7）Auto fan speed control

In this mode, indoor fan can run with Hig, Mid, Low speeds.

（8）Up and down swing control

After powered on, the lower swing motor will firstly rotate the guide louver to position 0, close up the air outlet vent; After unit turned on, if to set up swing function, when indoor fan stop running, the guide louver will stop at current position, inner fan motor is running, guide louver will resume to swing.From Cool, Dry, Fan modes to Heat mode, the guide louver will be opened at D position, when turn on swing will run at (A-D); from Heat mode to Cool, Dry, Fan mode, the fan louver will turn to B position, if turn on the swing, it will run at (A-C). When unit is turned off, the guide louver will turn to position 0, the swing is only available after preset the swing function, and indoor unit is running.

Note: When to set up at position L to B, A to C, B to D, the guide louver will swing between position W to D.



（9）Displayer

① Running figure and mode figure display

After powered on, the figure will be displayed, then only Power/running indicator turn on. When using remote conroller to open the unit, it will turn on, at the same time to display current setting running modes.

② Dual 8 display

When the unit is turned on, after powered on, the nixie tube will display the setting temp.(setting range is 16-30℃). When the preset temperature display signal has been received, the nixie tube will display the preset temperature; If the display ambient temperature signal has been received, the nixie tube will display the current indoor ambient temperature, if to set up others by remote controller that the display will maintain its status. At displaying ambient temperature, the unit received the remote control signal, it will display 5s preset temperature then turn to ambient temperature display. The ambient temperature sensor malfunction will display F1; Indoor tube sensor will display F2, wire jumper cap protection displays C5.

（10）PG motor lock protection

When turn on the fan motor, if motor continuously run for a while and the running speed is very slow, in order to prevent motor automatically self-protection, it will stop running and display lock; If currently turns unit on, that dual 8 will display lock error code H6; If current is unit off, will not display the block error information.

（11）**Power-off Memory**

Memory contents: Mode, UP/DOWN Swing, light, Set temp, Set fan speed.

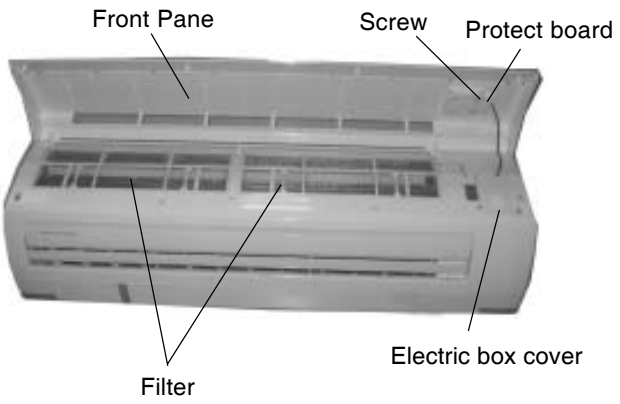
After de-energized, and re-energized, the unit will start to run with the memory function automatically. The system, if the last remote control signal do not set timer function, will memorize the last remote control signal and run according to it. If the last remote control signal has set timer function, the system is de-energized before the set time,when re-energized, the system will memorize the timer function, the set time will recalculate. If the last remote control signal has set timer function and the system is de-energized after the set time, when re-energized, the system will memorize the running status before de-energized.

7. 3 (18/24) Disassembly procedures for indoor unit

Operating Procedures / Photos

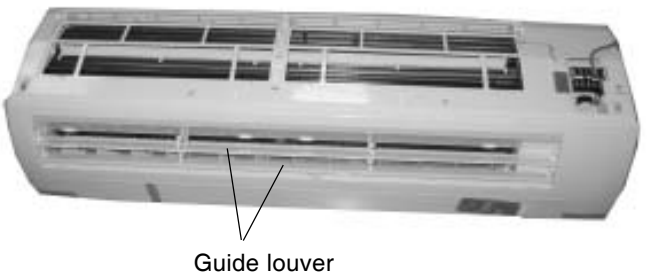
1. Disassemble the front panel, Filter, Electric box cover

Open the front panel ,Push the filter upwards to unloose the clasp, and then pull out the two filters. Screw off the screws fixing the electric box cover remove the cover out.



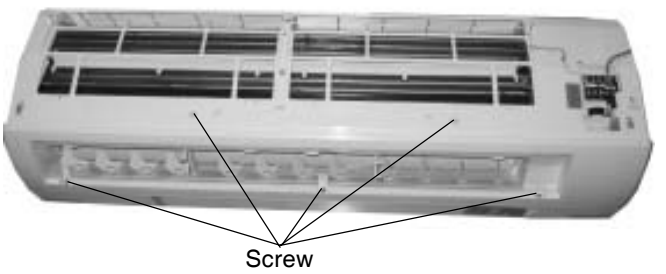
2. Disassemble the guide louver

Bend the guide louver so that the movable lock of guide louver is released to remove the guide louver.



3. Disassemble the front case

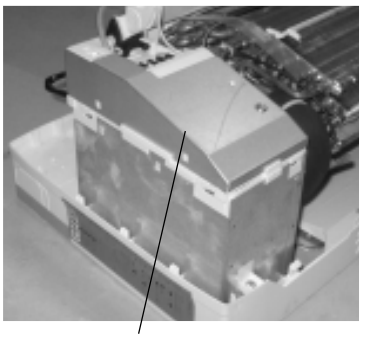
Open the 3 screw covers at the front case and screw off 5 screws. Pull out the movable latch at the front case with hand and then pull it backwards to disassemble the front case.



Operating Procedures / Photos

4. Disassemble the electric box cover

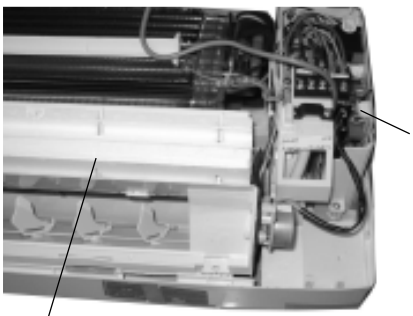
Screw off the screws fixing the electric box cover and then open the cover, next unscrew the screws fixing the toggle switch on the cover, at last remove the cover out.



Electric box cover

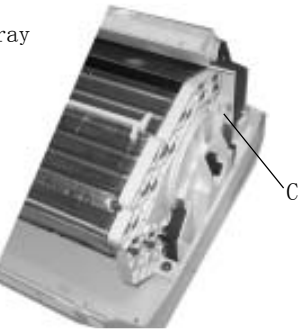
5. Disassemble water tray

Loosen the clasp of the front and rear of water tray sub-assy and lift them up, pull out of the connection wire of swing motor, then can take out the water tray sub-assy.
Note: Due to water tray is connected with the water drainage pipe, please pay more more attention do not hurt the fin on evaporator.



Connector

Water tray



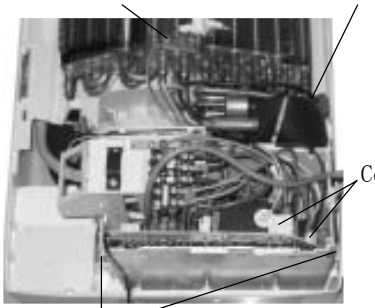
Claslp

5. Disassemble the electric box

Screw off the grounding wire of the evaporator, remove the temperature sensor for the pipe, put out the connection lines for the indoor motor. Screw off the screws fixing the electric box. Remove the electric box.

Grounding wire

Tube Sensor



Connector

Screws

Operating Procedures / Photos

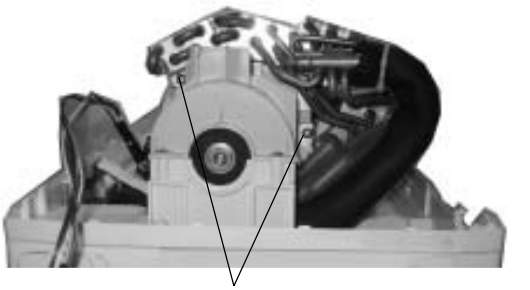
6. Disassembling the evaporator

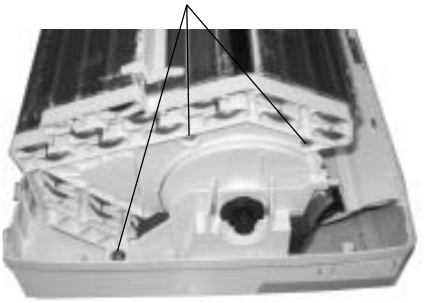
Screw off 5 screws fixing the left and right side of the evaporator, then elevate left side the evaporator to remove it backward.

CAUTION:

When repair, Carefully take out the evaporator and pay attention to protect the connecting pipe.

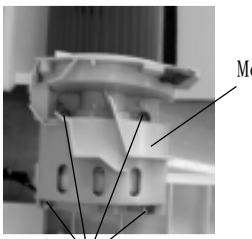
Screw off one screw which fix the connection board clamp.
Take down the connection board clamp.

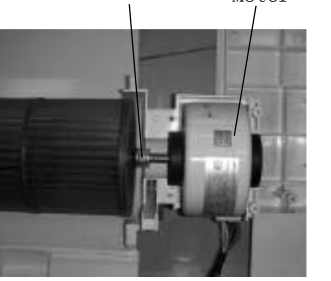




7. Disassembling motor and cross flow fan

Screw off 4 screws fixing the motor cover and then take the motor cover out.
Screw off the screw connecting the cross flow fan and motor, then pull out the motor and remove the cross flow fan.





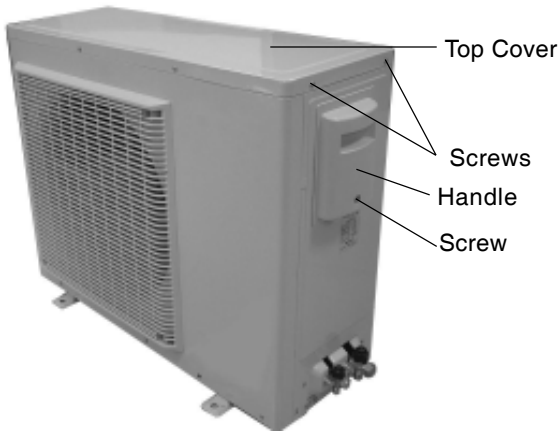
7. 5 (18) Disassembly Procedures for Outdoor Unit

Operating Procedures / Photos

1. Disassemble Handle and Top Cover

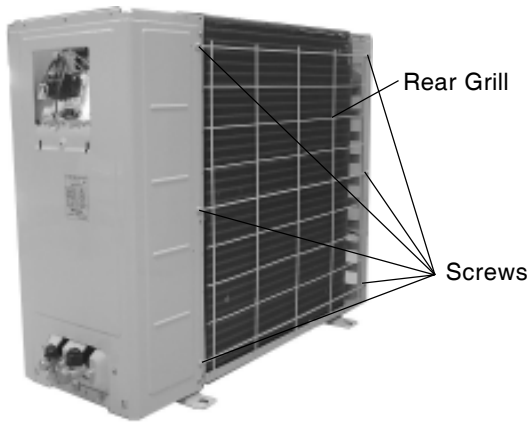
Unscrew the screw fixing the handle, then push it downwards to take it out.

Unscrew the screws fixing the top cover, and then lift the top cover to remove it.



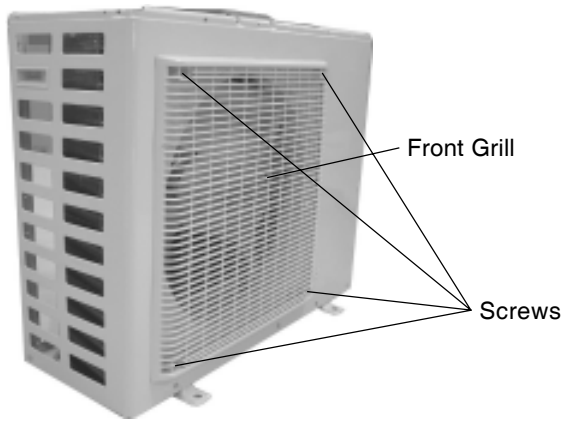
2. Disassemble Rear Grill

Unscrew the screws fixing the rear grill to remove it.



3. Disassemble Front grill

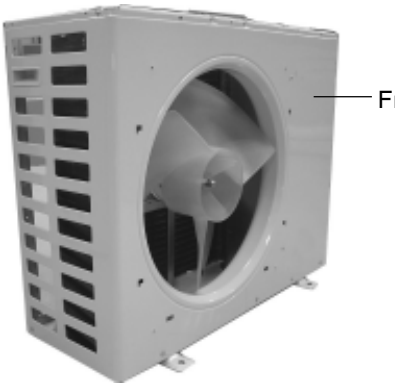
Unscrew the screws fixing the front grill ,and then lift it upwards to remove it.



Operating Procedures / Photos

4. Disassemble Front plate

Unscrew the screws fixing the cabinet to remove it.

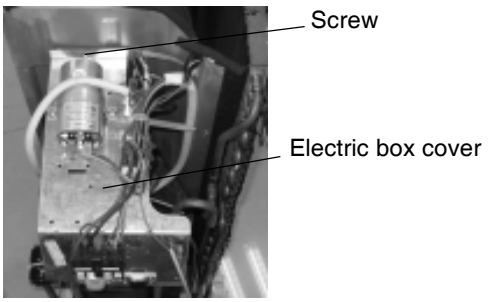


5. Disassembel Right side plate

Unscrew the 9 screws of the right side plate, then take down the right side plate.

5. Disassemble Electric Box Sub-assy

unscrew the screw of electric box, pull out the lead out insert of compressor, four-way valve and motor, then take down the electric box.

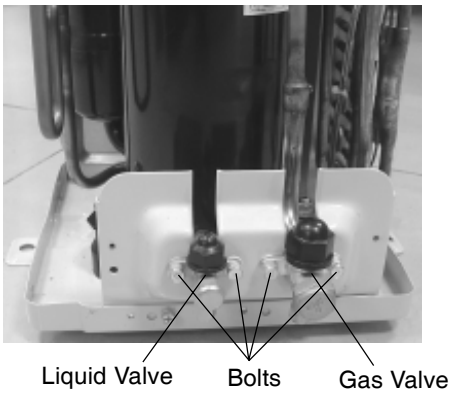


Operating Procedures / Photos

7. Disassemble Gas and Liquid Valves

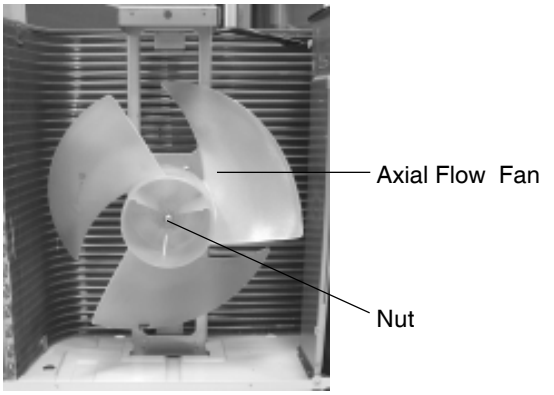
Unsolder the pipeline connecting with valves (to prevent soldering gun from burning out the chassis).Unscrew 2 bolts fixing gas valve ,and then unsolder the weld spot between pipeline and gas valve to remove gas valve. Unscrew the 2 bolts fixing liquid valve, and then unsolder the weld spots between pipeline and liquid valve to remove liquid valve.

(Note:During unsoldering ,wrap the valves with wet cloth to avoid damage for high temperature.)



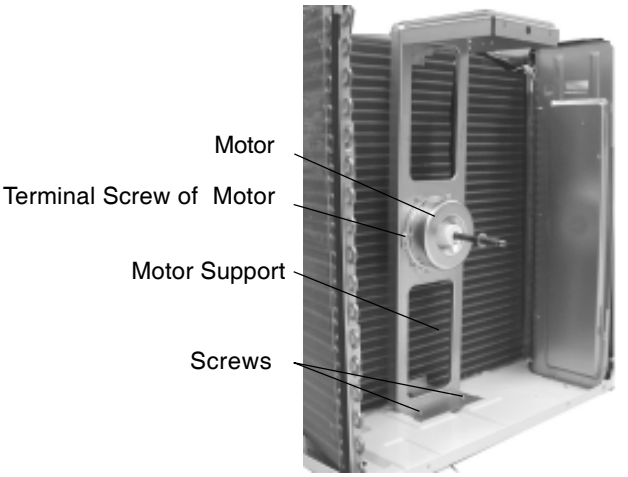
8. Disassemble Axial Flow Fan

Unscrew the nut fixing the fan with a spanner to take out the fan.



9. Disassemble Outdoor Motor

Unscrew the screws fixing the motor support, and then lift it upwards to remove it. Unscrew the screws fixing the motor and pull out the connection line between it and electric box to remove it.

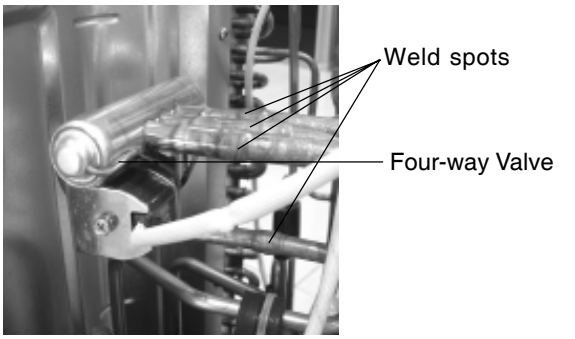


Operating Procedures / Photos

10. Disassemble Four-way Valve

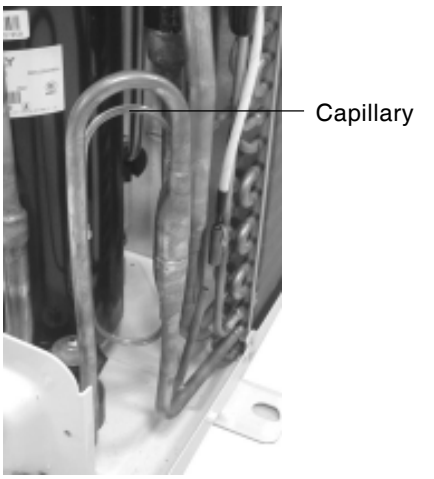
Only for cooling and heating unit

Unscrew the fixing nut of the four-way valve coil and remove the coil. Wrap the four-way valve with wet cotton and unsolder the 4 weld spots connecting the four-way valve to take it out. Welding process should be as quick as possible and keep wrapping cotton wet all the time. Be sure not to burn out the lead-out wire of compressor.



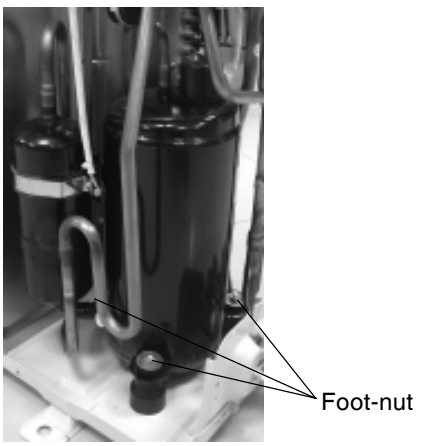
11. Disassemble Capillary

Unsolder the weld spots of capillary,valve and outlet pipe of condenser to remove the capillary. Prevent welding slag from blocking the capillary.



12. Disassemble Compressor

Unsolder the pipeline connecting the compressor, and then unscrew the 3 foot-nuts fixing conpressor to remove it.

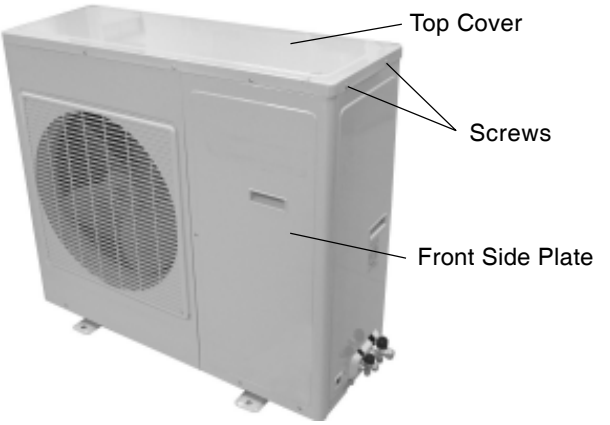


7. 6 (24) Disassembly Procedures for Outdoor Unit

Operating Procedures / Photos

1. Disassemble Top Cover and Front Side Plate

Unscrew the screws fixing the top cover, and then lift the top cover to remove it.
Unscrew the 3 screws fixing the front side plate to remove it.

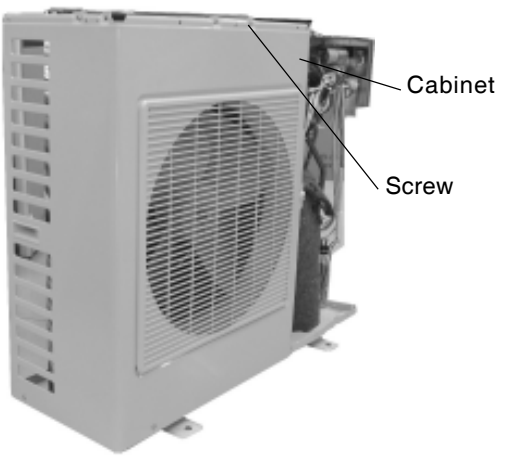


2. Disassemble Rear Grill

Unscrew the 4 screws fixing the rear grill to remove it.

3. Disassemble Cabinet

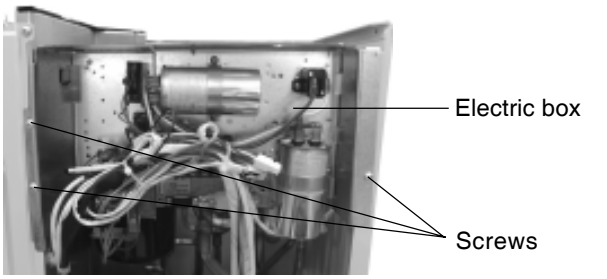
Unscrew the screws fixing the cabinet to remove it.



Operating Procedures / Photos

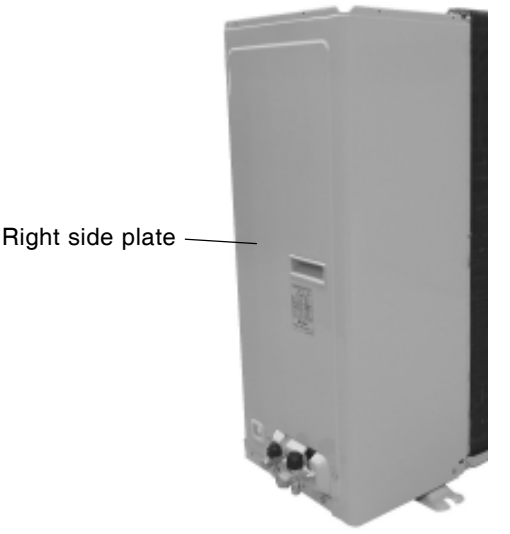
4. Disassemble Electric Box Sub-assy

Unscrew the 2 screws fixing electric box to pull out the connection line between fan motor, compressor,four-way valve, and then lift the electric box to take it out.



5. Disassemble Right side plate

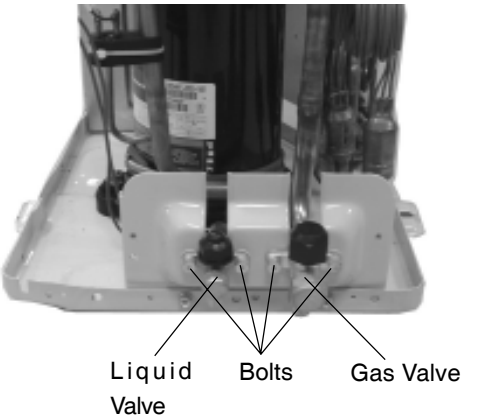
Unscrew the screw of the right side plate, then take down the right side plate.



6. Disassemble Gas and Liquid Valves

Unsolder the pipeline connecting with valves (to prevent soldering gun from burning out the chassis). Unscrew 2 bolts fixing gas valve ,and then unsolder the weld spot between pipeline and gas valve to remove gas valve. Unscrew the 2 bolts fixing liquid valve, and then unsolder the soldering spot between pipeline and liquid valve to remove liquid valve.

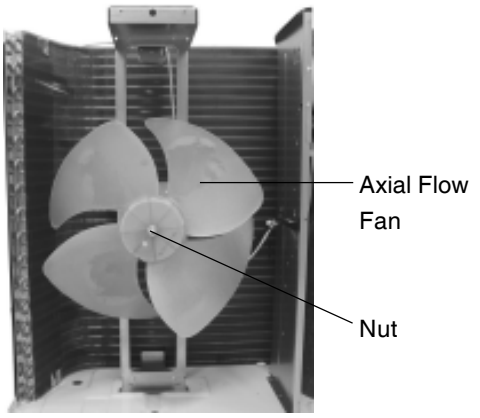
(Note:During unsoldering ,wrap the valves with wet cloth avoid damage for high temperature.)



Operating Procedures / Photos

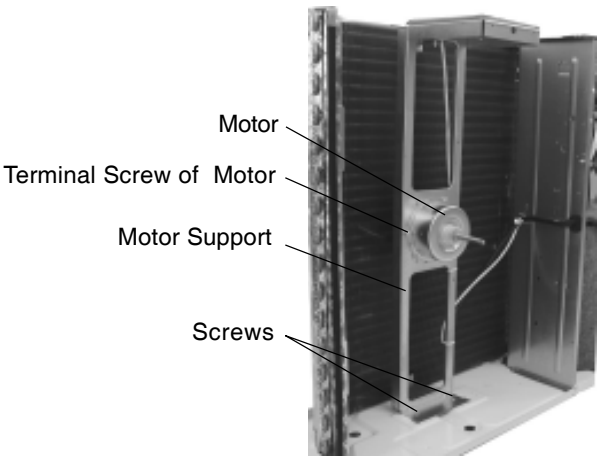
7. Disassemble Axial Flow Fan

Unscrew the nut fixing the fan with a spanner to take out the fan.



8. Disassemble Outdoor Motor

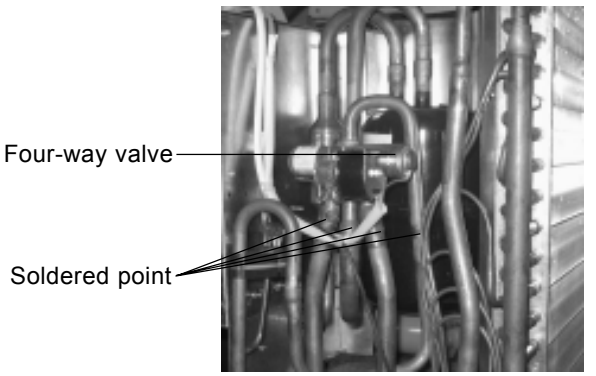
Unscrew the screws fixing the motor support, and then lift it upwards to remove it. Unscrew the screws fixing the motor and pull out the connection line between it and electric box to remove it.



9. Disassemble Four-way Valve

Only for cooling and heating unit

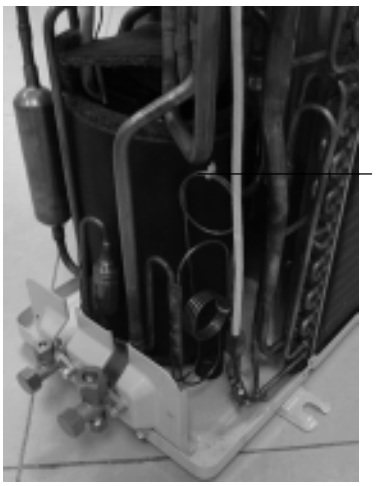
Unscrew the fixing nut of the four-way valve coil and remove the coil. Wrap the four-way valve with wet cotton and unsolder the 4 weld spots connecting the four-way valve to take it out. Welding process should be as quick as possible and keep wrapping cotton wet all the time. Be sure not to burn out the lead-out wire of compressor.



Operating Procedures / Photos

10. Disassemble Capillary

Unsolder the weld spots of capillary,valve and outlet tube of condenser to remove the capillary. Prevent welding slag from blocking the capillary.



11. Disassemble Compressor

Unsolder the pipeline connecting the compressor, and then unscrew the 3 foot-nuts fixing conpressor to remove it.

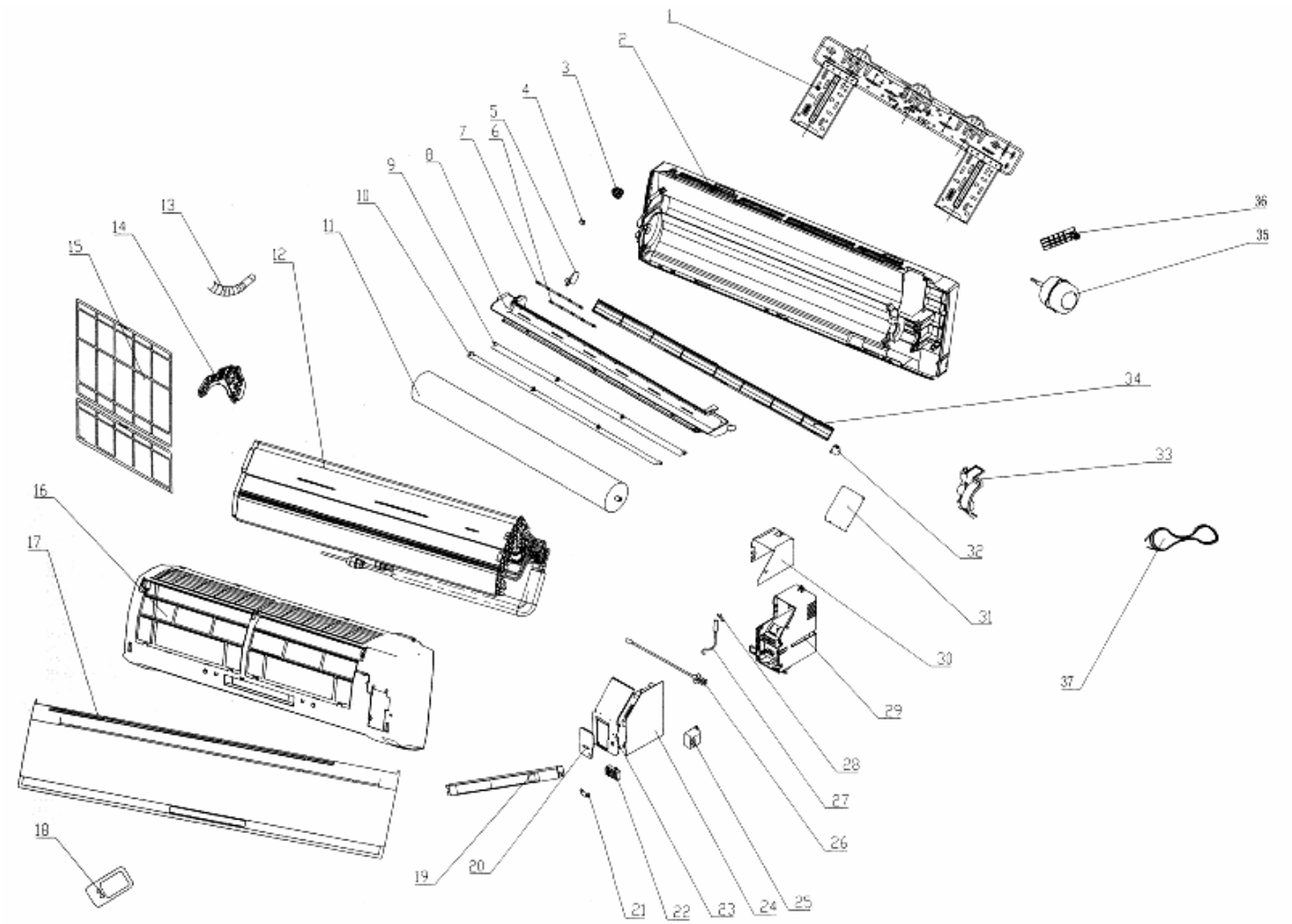
PARTS GUIDE

KING SERIES

ASH-18AK, ASH-24AK

sinclair
AIR CONDITIONING

8. (18/24) Exploded View of Components and Parts of Indoor unit



Parts List for ASH-18AK Indoor unit

No.	Description	Parts No.	Qty	Price rank
ASH-18AK Indoor unit				
1	Wall Mounting Frame	01252004	1	AK
2	Rear Case	22202329	1	AW
3	O-Gasket of Cross Fan Bearing	76512203	1	AC
4	Screw Cap	24252015	3	AA
5	Round Louver	10512429	11	AB
6	Swing Lever	10582057	1	AC
7	Swing Lever	10582058	1	AC
8	Water Tray	20182057	1	AW
9	Upper Air Deflector	10512085	1	AF
10	Lower Guide Louver	10512086	1	AF
11	Cross Flow Fan	10352022	1	AN
12	Evaporator Assy	0100224502	1	BD
13	Drain Pipe	05230014	1	AD
14	Evaporator Support	24212067	1	AF
15	Filter Sub-Assy	11122048	2	AD
16	Front Case Assy	20002652	1	AU
17	Front Panel Assy	20002843	1	AM
18	Remote Controller	30510041	1	AT
19	Displaying Light Board	30545033	1	AZ
20	Electric Box Cover	20112019	1	AE
21	Fixed Clamp	71010103	1	AB
22	Terminal Board	42010262	1	AD
23	Electric Box Cover	20112020	1	AE
24	Main PCB	30135096	1	BA
25	Transformer 57X25C	43110237	1	AM
26	Ambient Temperature Sensor	390000451	1	AD
27	Tube Sensor	390000591	1	AD
28	Sensor Insert	42020063	1	AD
29	Electric Box	20112018	1	AK
30	Lower Shieldof Electric Box	01592037	1	AE
31	Upper Shieldof Electric Box	01592038	1	AD
32	Stepping Motor	15213001	1	AK
33	Motor Press Plate	26112095	1	AE
34	Helicoid tongue	26252009	1	AH
35	Fan Motor	15012077	1	AX
36	Pipe Clamp	26112096	1	AD
37	Connecting Cable	400205402	1	AN

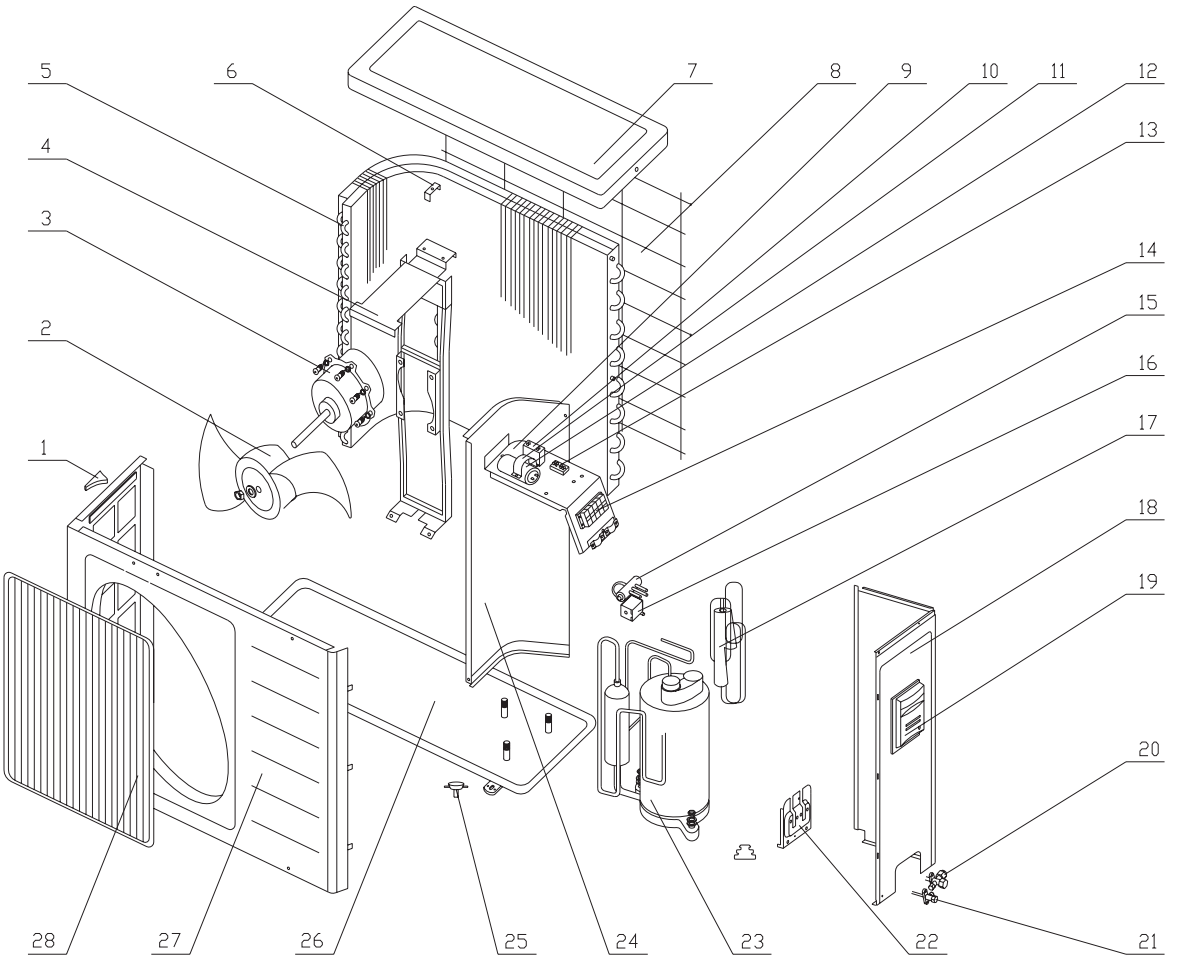
The data are subject to change without notice.

Parts List for ASH-24AK Indoor unit

No.	Description	Parts No.	Qty	Price rank
ASH-24AK Indoor unit				
1	Wall Mounting Frame	01252004	1	AK
2	Rear Case	22202329	1	AW
3	O-Gasket of Cross Fan Bearing	76512203	1	AC
4	Screw Cap	24252015	3	AA
5	Round Louver	10512429	11	AB
6	Swing Lever	10582057	1	AC
7	Swing Lever	10582058	1	AC
8	Water Tray	20182057	1	AW
9	Upper Air Deflector	10512085	1	AF
10	Lower Guide Louver	10512086	1	AF
11	Cross Flow Fan	10352022	1	AN
12	Evaporator Assy	010022365	1	BF
13	Drain Pipe	05230014	1	AD
14	Evaporator Support	24212067	1	AF
15	Filter Sub-Assy	11122048	2	AD
16	Front Case Assy	20002652	1	AU
17	Front Panel Assy	20002843	1	AM
18	Remote Controller	30510041	1	AT
19	Displaying Light Board	30545033	1	AZ
20	Electric Box Cover	20112019	1	AE
21	Fixed Clamp	71010103	1	AB
22	Terminal Board	4201026201	1	AD
23	Electric Box Cover	20112020	1	AE
24	Main Board	30135163	1	BB
25	Transformer 57X25C	43110237	1	AM
26	Ambient Temperature Sensor	390000451	1	AD
27	Tube Sensor	390000591	1	AD
28	Sensor Insert	42020063	1	AD
29	Electric Box	20112018	1	AK
30	Lower Shieldof Electric Box	01592037	1	AE
31	Upper Shieldof Electric Box	01592038	1	AD
32	Stepping Motor	15213001	1	AK
33	Motor Press Plate	26112095	1	AE
34	Helicoid tongue	26252009	1	AH
35	Fan Motor	15012077	1	AX
36	Pipe Clamp	26112096	1	AD
37	Connecting Cable	400205382	1	AN

The data are subject to change without notice.

8. (18) Exploded View of Components and Parts of outdoor unit

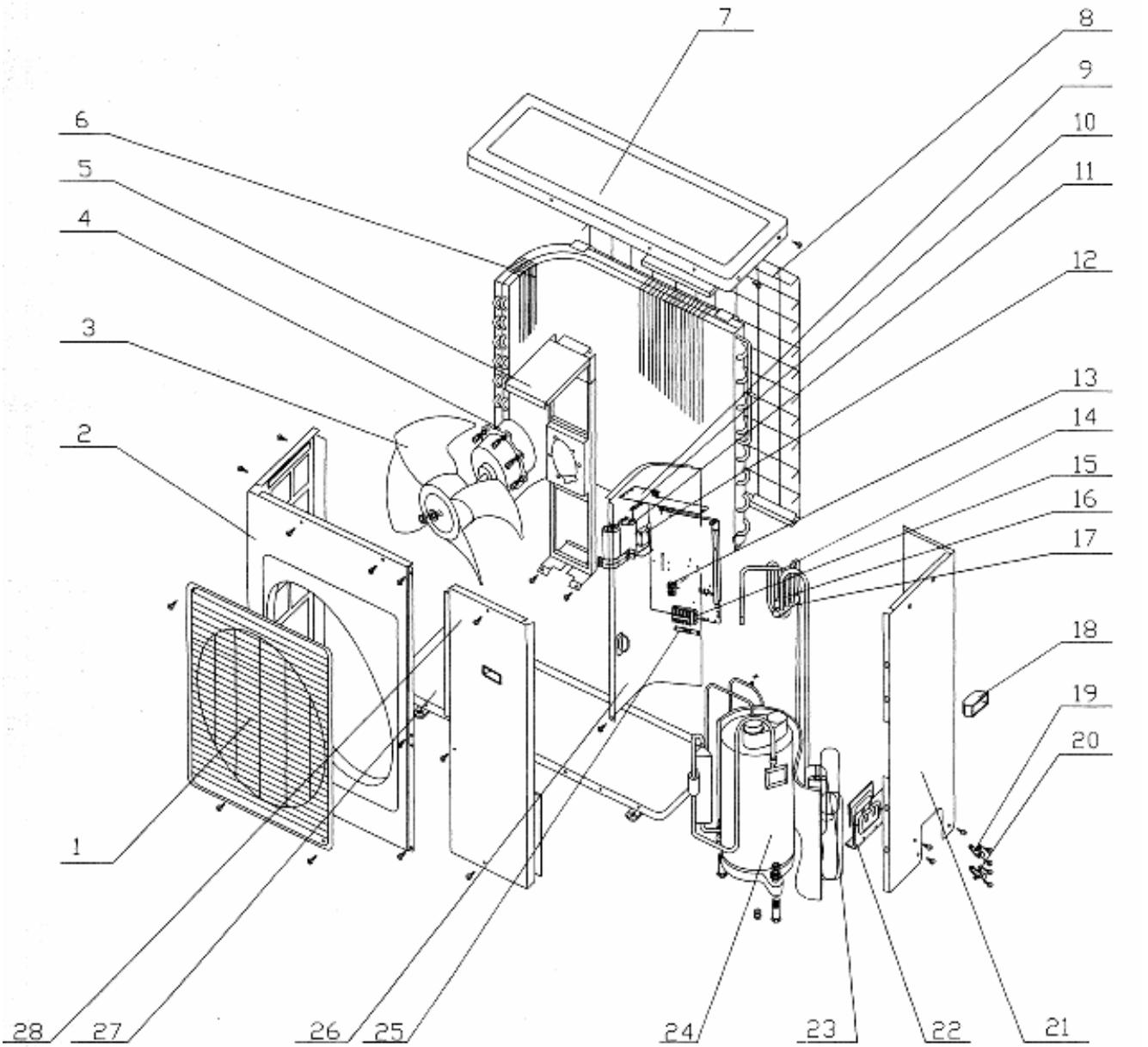


Parts List for ASH-18AK Outdoor unit

No.	Description	Parts No.	Qty	Price rank
ASH-18AK Outdoor unit				
1	Small Handle	26235401	1	AC
2	Axial Flow Fan	10333426	1	AR
3	Fan Motor	15013070	1	AZ
4	Motor Support	01703059	1	AF
5	Condenser Assy	01113033	1	BK
6	Condenser Clamp	01175202	2	AB
7	Top Cover	01255001	1	AH
8	Rear Grill	014730371	1	AG
9	Electrical Box	01403835	1	AF
10	Capacitor CBB61 3.5kuF/450V	33010010	1	AG
11	Capacitor Clamp	02141375	1	AB
12	Capacitor	33000039	1	AM
13	Terminal Board 2-8	42011103	1	AD
14	Terminal Board	42010265	1	AE
15	4-way Valve	430004032	1	BA
16	4-way Valve Accessary	430004002	1	AM
17	Capillary Assy	03103555	1	AZ
18	Right Side Plate	01305013	1	AH
19	Handle	26235254	1	AC
20	Gas Valve Assy	07130213	1	AH
21	Cut-off Valve	07100003	1	AG
22	Valve support	01713076	1	AD
23.1	Compressor and Fittings	00103007	1	BW
23.2		Build in		
23.3	Compressor Gasket 4CYC00008	76710202	3	AE
24	Clapboard Sub-Assy	01233035	1	AK
25	Drainage Connecter	06123401	1	AA
26	Chassis	0120362602P	1	AU
27	Front Side Plate	01305015	1	AW
28	Front Grill	22415001	1	AL

The data are subject to change without notice.

8. (24) Exploded View of Components and Parts of outdoor unit



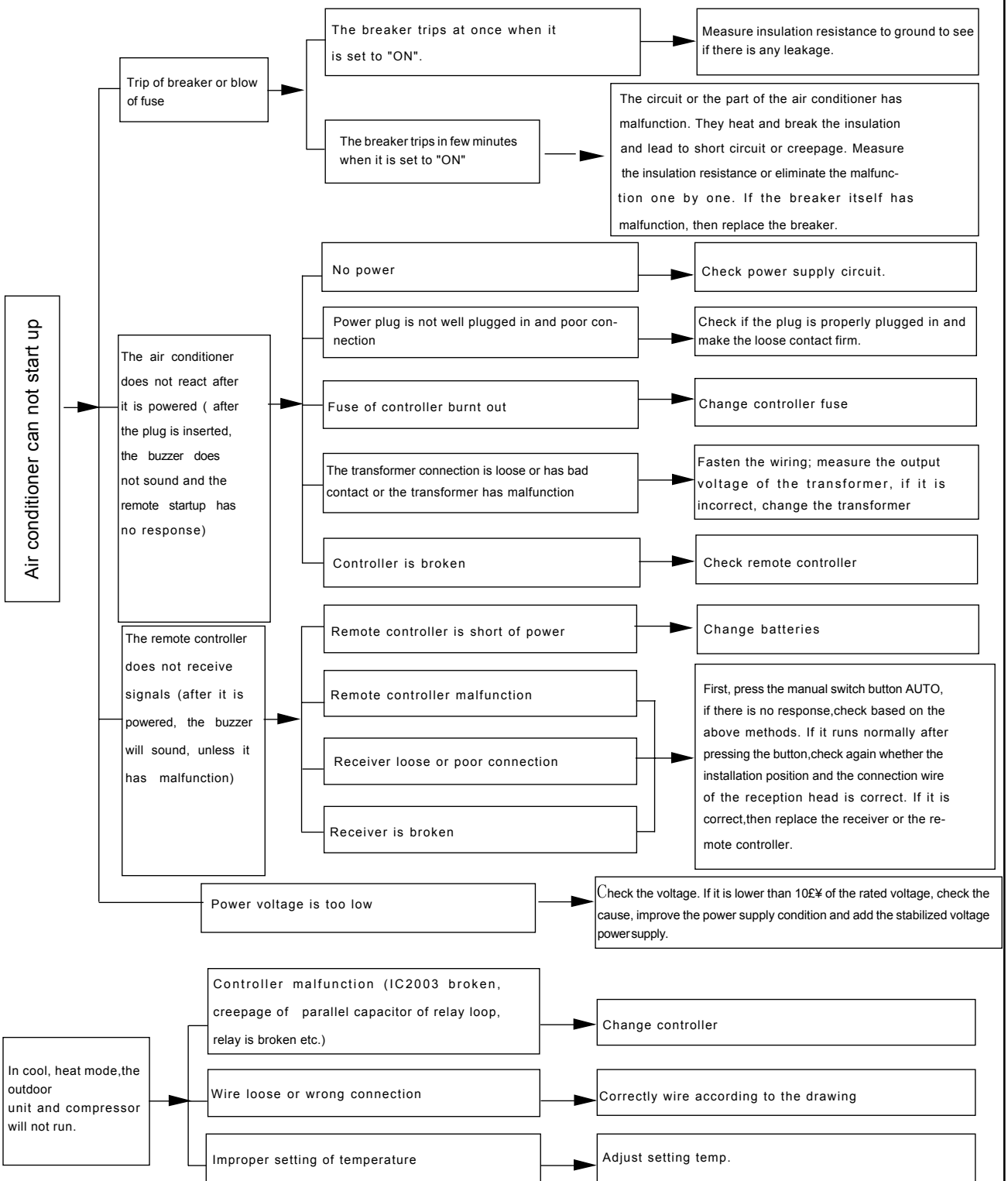
Parts List for ASH-24AK Outdoor unit

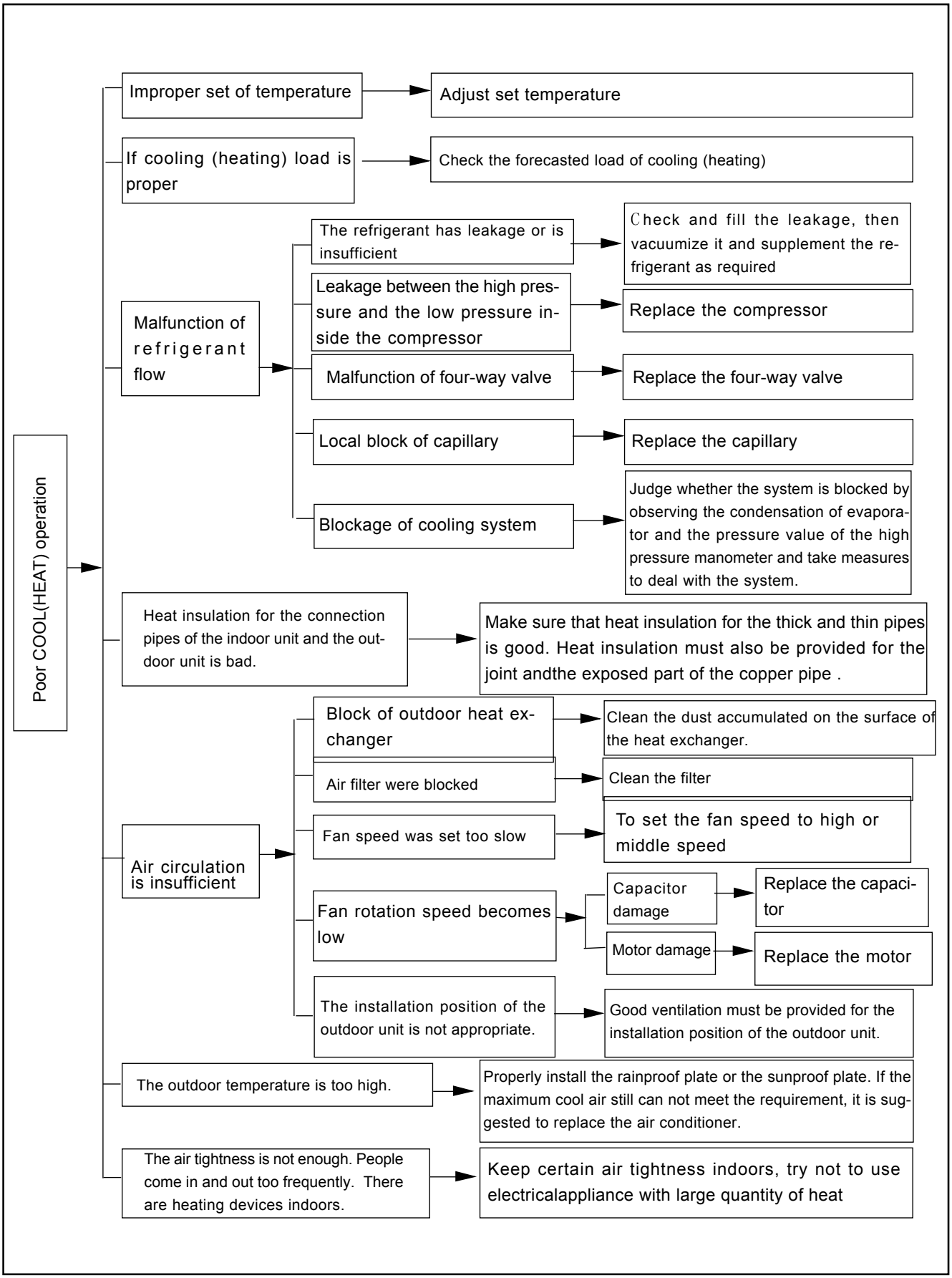
No.	Description	Parts No.	Qty	Price rank
ASH-24AK Outdoor unit				
1	Panel Grille	22414102	1	AL
2	Front Plate	01433017	1	AW
3	Axial Flow Fan φ472X165	10338731	1	AR
4	Fan Motor	15015421	1	BA
5	Motor Support	01703027	1	AE
6	Condenser Assy	01113034	1	BL
7	Top Cover	01255262	1	AQ
8	Mesh Enclosure	01473028	1	AG
9	Electric Box Cover Plate	01413047	1	AF
10	Electric Box Sub-Assy	01403248	1	AF
11	Capacitor CBB65 50uF/450V φ50X120	33000001	1	AL
12	Capacitor CBB61 3.5kuF/450V	33010010	1	AG
13	Terminal Board	42010194	1	AD
14	4-way Valve	03023724	1	AY
15	Terminal Board 2-8	42011103	1	AD
16	4-way Valve Accessary	430004002	1	AM
17	4-way Valve	430004032	1	BA
18	Handle	26235253	1	AC
19	Gas Valve Sub-Assy	07103030	1	AV
20	Liquid Valve Assy	07133024	1	AU
21	Rear Side Plate Sub-Assy	01303115	1	AM
22	Valve Support Sub-Assy	01715001	1	AD
23	Capillary Assy	03103556	1	AZ
24.1	Compressor and Fittings	00100525	1	CA
24.2		Build in		
24.3	Compressor Gasket 4CYC00008	76710202	3	AE
25	Isolation Washer	70410523	1	AC
26	Mid Clapboard Sub-Assy	01233024	1	AK
27	Underpan Sub-Assy	01205073	1	AU
28	Front Side Plate	01303023	1	AG

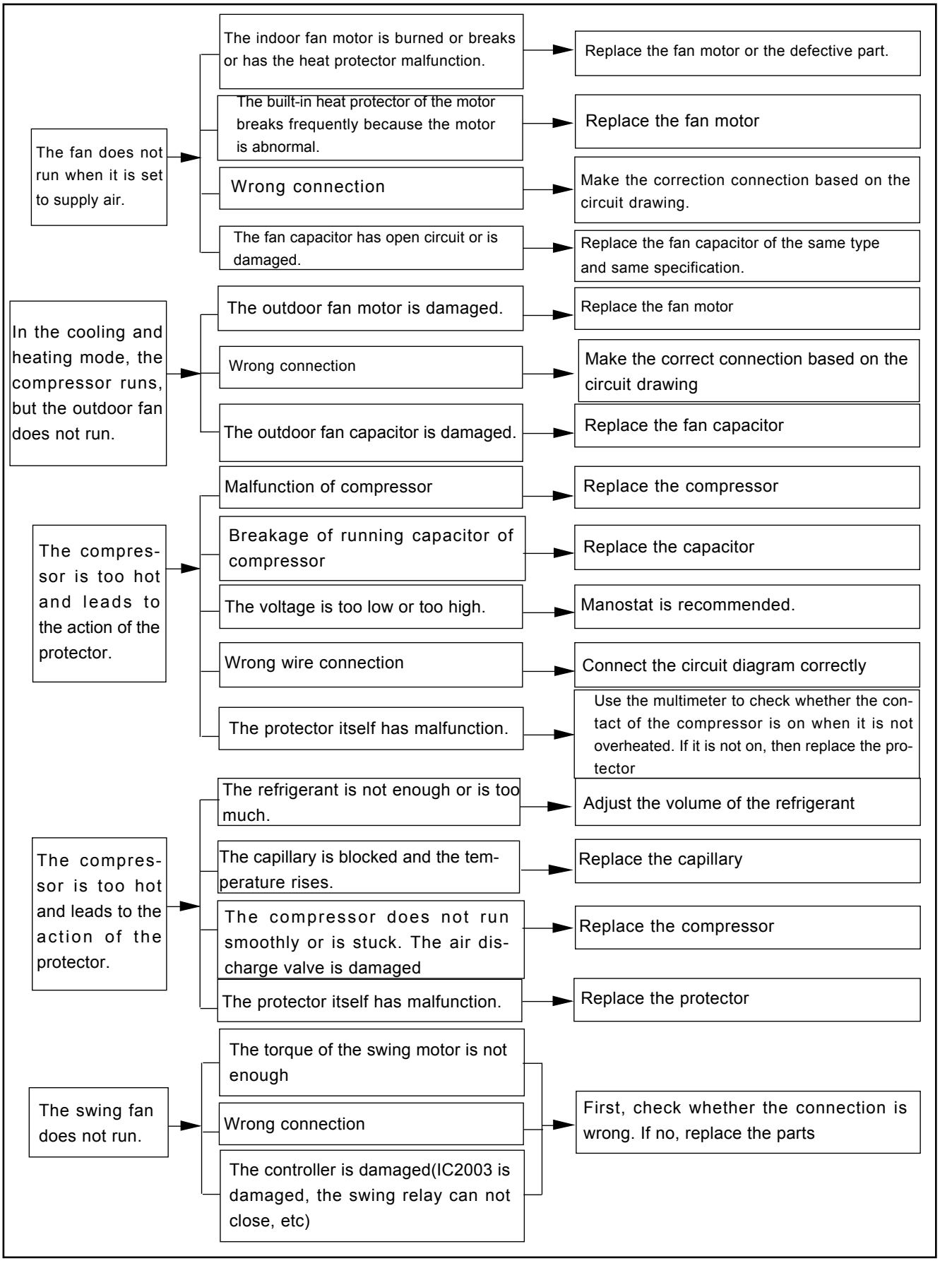
The data are subject to change without notice.

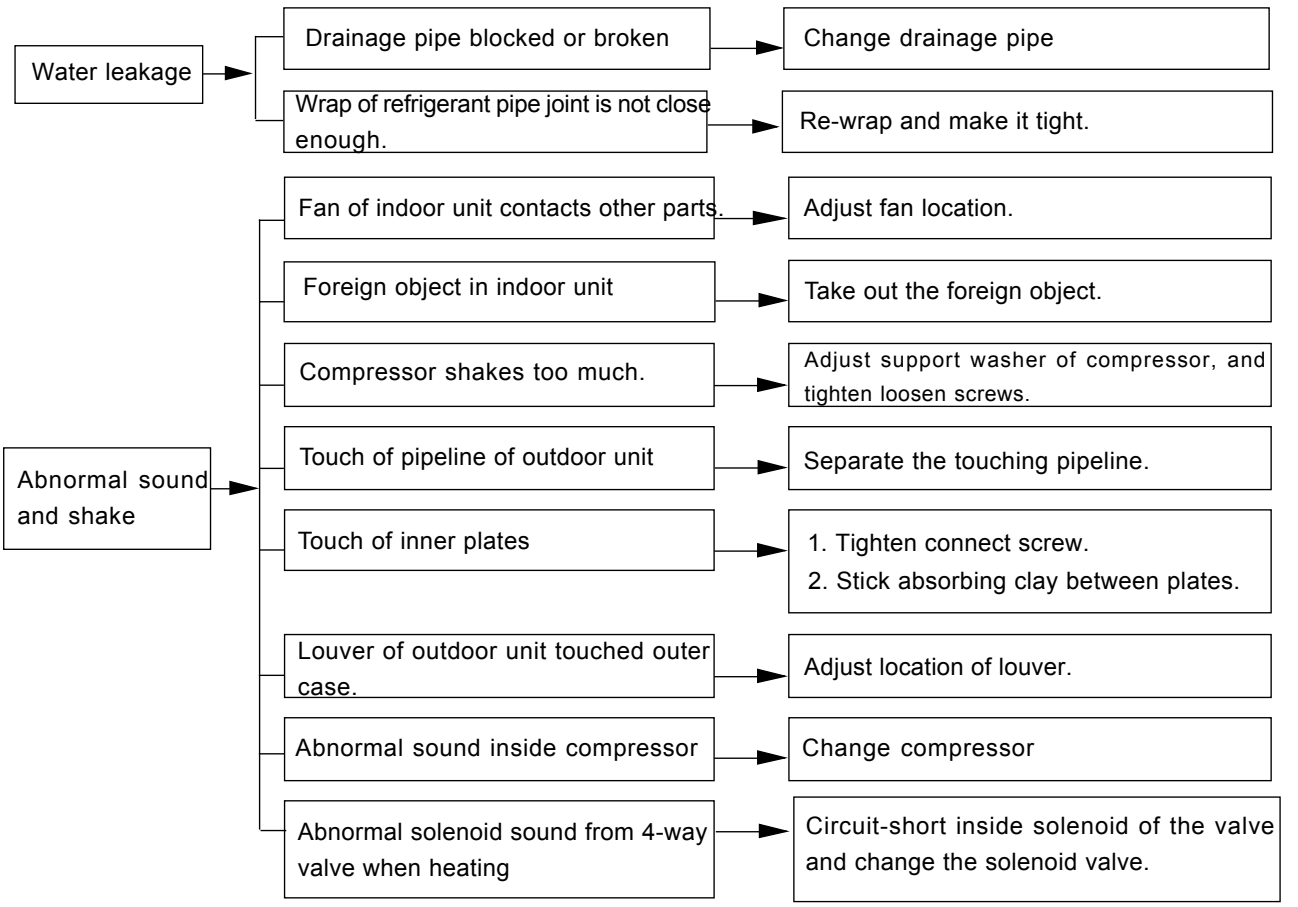
9 Failure and analysis

Note: When replacing the controller, make sure insert the wire jumper into the new controller, otherwise, the running indicator off 3s, blink 15 times, (the dual eight will display C5) but cannot turn on the unit.


Air conditioner can not start up
Trip of breaker or blow of fuse
The breaker trips at once when it is set to "ON".
Measure insulation resistance to ground to see if there is any leakage.
The breaker trips in few minutes when it is set to "ON"
The circuit or the part of the air conditioner has malfunction. They heat and break the insulation and lead to short circuit or creepage. Measure the insulation resistance or eliminate the malfunction one by one. If the breaker itself has malfunction, then replace the breaker.
The air conditioner does not react after it is powered (after the plug is inserted, the buzzer does not sound and the remote startup has no response)
No power
Check power supply circuit.
Power plug is not well plugged in and poor connection
Check if the plug is properly plugged in and make the loose contact firm.
Fuse of controller burnt out
Change controller fuse
The transformer connection is loose or has bad contact or the transformer has malfunction
Fasten the wiring; measure the output voltage of the transformer, if it is incorrect, change the transformer
Controller is broken
Check remote controller
The remote controller does not receive signals (after it is powered, the buzzer will sound, unless it has malfunction)
Remote controller is short of power
Change batteries
Remote controller malfunction
Receiver loose or poor connection
Receiver is broken
First, press the manual switch button AUTO, if there is no response,check based on the above methods. If it runs normally after pressing the button,check again whether the installation position and the connection wire of the reception head is correct. If it is correct,then replace the receiver or the remote controller.
Power voltage is too low
Check the voltage. If it is lower than 10£¥ of the rated voltage, check the cause, improve the power supply condition and add the stabilized voltage power supply.
In cool, heat mode,the outdoor unit and compressor will not run.
Controller malfunction (IC2003 broken, creepage of parallel capacitor of relay loop, relay is broken etc.)
Change controller
Wire loose or wrong connection
Correctly wire according to the drawing
Improper setting of temperature
Adjust setting temp.


Poor COOL(HEAT) operation
Improper set of temperature
Adjust set temperature
If cooling (heating) load is proper
Check the forecasted load of cooling (heating)
Malfunction of refrigerant flow
The refrigerant has leakage or is insufficient
Check and fill the leakage, then vacuumize it and supplement the refrigerant as required
Leakage between the high pressure and the low pressure inside the compressor
Replace the compressor
Malfunction of four-way valve
Replace the four-way valve
Local block of capillary
Replace the capillary
Blockage of cooling system
Judge whether the system is blocked by observing the condensation of evaporator and the pressure value of the high pressure manometer and take measures to deal with the system.
Heat insulation for the connection pipes of the indoor unit and the outdoor unit is bad.
Make sure that heat insulation for the thick and thin pipes is good. Heat insulation must also be provided for the joint andthe exposed part of the copper pipe .
Air circulation is insufficient
Block of outdoor heat exchanger
Clean the dust accumulated on the surface of the heat exchanger.
Air filter were blocked
Clean the filter
Fan speed was set too slow
To set the fan speed to high or middle speed
Fan rotation speed becomes low
Capacitor damage
Replace the capacitor
Motor damage
Replace the motor
The installation position of the outdoor unit is not appropriate.
Good ventilation must be provided for the installation position of the outdoor unit.
The outdoor temperature is too high.
Properly install the rainproof plate or the sunproof plate. If the maximum cool air still can not meet the requirement, it is suggested to replace the air conditioner.
The air tightness is not enough. People come in and out too frequently. There are heating devices indoors.
Keep certain air tightness indoors, try not to use electricalappliance with large quantity of heat


The fan does not run when it is set to supply air.
The indoor fan motor is burned or breaks or has the heat protector malfunction.
Replace the fan motor or the defective part.
The built-in heat protector of the motor breaks frequently because the motor is abnormal.
Replace the fan motor
Wrong connection
Make the correction connection based on the circuit drawing.
The fan capacitor has open circuit or is damaged.
Replace the fan capacitor of the same type and same specification.
In the cooling and heating mode, the compressor runs, but the outdoor fan does not run.
The outdoor fan motor is damaged.
Replace the fan motor
Wrong connection
Make the correct connection based on the circuit drawing
The outdoor fan capacitor is damaged.
Replace the fan capacitor
The compressor is too hot and leads to the action of the protector.
Malfunction of compressor
Replace the compressor
Breakage of running capacitor of compressor
Replace the capacitor
The voltage is too low or too high.
Manostat is recommended.
Wrong wire connection
Connect the circuit diagram correctly
The protector itself has malfunction.
Use the multimeter to check whether the contact of the compressor is on when it is not overheated. If it is not on, then replace the protector
The compressor is too hot and leads to the action of the protector.
The refrigerant is not enough or is too much.
Adjust the volume of the refrigerant
The capillary is blocked and the temperature rises.
Replace the capillary
The compressor does not run smoothly or is stuck. The air discharge valve is damaged
Replace the compressor
The protector itself has malfunction.
Replace the protector
The swing fan does not run.
The torque of the swing motor is not enough
Wrong connection
The controller is damaged(IC2003 is damaged, the swing relay can not close, etc)
First, check whether the connection is wrong. If no, replace the parts


Water leakage
Drainage pipe blocked or broken
Change drainage pipe
Wrap of refrigerant pipe joint is not close enough.
Re-wrap and make it tight.
Abnormal sound and shake
Fan of indoor unit contacts other parts.
Adjust fan location.
Foreign object in indoor unit
Take out the foreign object.
Compressor shakes too much.
Adjust support washer of compressor, and tighten loosen screws.
Touch of pipeline of outdoor unit
Separate the touching pipeline.
Touch of inner plates
1. Tighten connect screw.
2. Stick absorbing clay between plates.
Louver of outdoor unit touched outer case.
Adjust location of louver.
Abnormal sound inside compressor
Change compressor
Abnormal solenoid sound from 4-way valve when heating
Circuit-short inside solenoid of the valve and change the solenoid valve.

There are no heating malfunctions in the above for the cooling only unit.

PG motor locked protection H6:

Probable reasons:

1. Air vents were blocked which may cause the fan speed is too slow;
2. Fan blade locked;
3. Motor locked;
4. Fan motor capacitor damaged;
5. Motor damaged (ordors, winding, open circuit or shortcircuit are not normal, when testing the winding, pls distinguish whether the motor body cause temperature is too high so that bring on the thermal protector starts up)
6. IC board damaged (during normally running, there are voltage at both capacity input and output)
7. Mainboard damaged.
8. Motor thermal protection.

Disposal methods:

1. Remove the obstruction;
2. Reassembling;
3. Replace motor;
4. Replace capacitor;
5. Replace motor;
6. Replace circuit board;
7. Replace mainboard;

8.Under the normal circumstances, the motor will not act, but in other circumstances, such as evaporator is very dirty, to much dust attached on the fan blade that will cause the motor overload running, so that during the operation, frequent thermal protection will happen, so it is need to be cleaned or replaced.